User's Manual

IMA63-EZ01
First edition

Foreword

Thank you for purchasing the paperless recorder!
This manual is about the functions, settings, wiring methods, methods of operation, failure of treatment methods of the paperless recorder. To ensure correct use, please read this manual carefully and use properly before operation and keep this manual in a safe place for quick reference.

Notice

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact us.
- Copying or reproducing all or any part of the contents of this manual without our permission is strictly prohibited.

Revisions

First edition: March 2013

Safety Precautions

The following general safety precautions must be observed during all phases of operation. If the Instrument is used in a manner not specified in this manual, the protection provided by the Instrument may be impaired. We assume no liability for the customer's failure to comply with these requirements.

WARNING

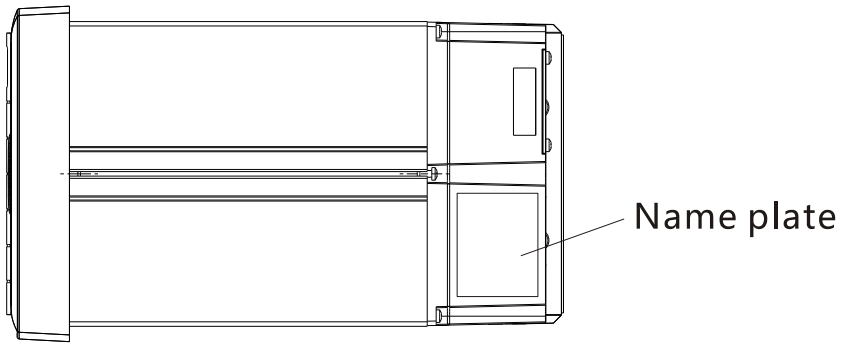
- **Power Supply**
  Before connecting the power cord, ensure that the power supply voltage matches the voltage rating for the instrument.
- **Protective Grounding**
  Make sure to connect the protective grounding to prevent electric shock before turning ON the power.
- **Necessity of Protective Grounding**
  Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Doing so poses a potential shock hazard.
- **Defect of Protective Grounding**
  Do not operate the instrument when the protective grounding or the fuse might be defective. Also, make sure to check them before operation.
- **Do Not Operate in Explosive Atmosphere**
  Do not operate the instrument in the presence of flammable liquids or vapors.
  Operation of any electrical instrument in such an environment constitutes a safety hazard.
- **Do Not Remove Covers**
  Some areas inside the instrument have high voltages. Do not remove the cover if the power supply is connected. The cover should be removed by our qualified personnel only.
- **External Connection**
  Connect the protective grounding before connecting to the item under measurement or control unit.
- **Damage to the protection**
  Using the instrument in a manner not specified in this manual can damage the instrument's protection.

Checking the Contents of the Package

Unpack the box and check the contents before operating the instrument. If some of the contents are not correct or missing or if there is physical damage, contact the dealer from which you purchased them.

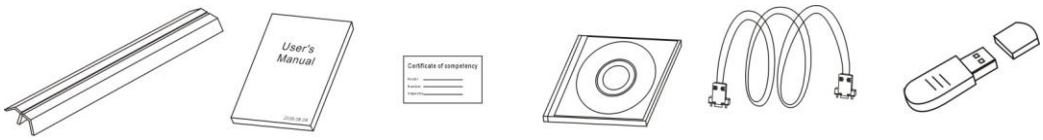
Main Unit

There is a name plate on the up side of the instrument's body. Open the cover and check that the model name and suffix code given on the name plate match those on the order.



Standard Accessories

The following standard accessories are supplied with the instrument. Make sure that all items are present and undamaged.



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Number	Part Name	Q'ty	Notes
1	Mounting bracket	2	For panel mounting
2	User's Manual	1	This manual
3	Certification	1	Manufacture Date
4	Application (Standard Software)	1	Included only when the Communication or External storage is ordered. For Windows 98/2000/XP/Windows ME Provided on a CD-ROM
5	Communication Cord	1	Included only when the Communication is ordered.1.5 meters.
6	U Disk	1	Included only when the External storage is ordered. Capacity and model of the USB Storage may vary.

How to Use This Manual

Structure of the Manual

This user's manual consists of the following sections:

Chapter	Title and Contents
1	**Overview of Functions** Describes the functions of the instrument.
2	**Before Using the Instrument** Describes the installation and wiring procedures.
3	**Names of Parts/Run Mode/Common Operations** Describes the names of each part of the instrument, how to use the storage medium drive, run mode, and common key operations.
4	**Switching Operation Screens** Describes how to use the operation screen such as the trend display and digital display. Describes the operations that can be performed using the arrow keys, page key and the enter key on the front panel.
5	**System Configurations** Describes the parameters of system running.
6	**Input Channel Settings** Describes how to set input specifications such as the range, filter, and burnout.
7	**Setting Alarms** Describes how to set alarms and relays.
8	**Setting Analog Outputs** Describes how to set analog outputs specifications such as the output channel.
9	**Data acquisition and Saving to External Storage Medium** Describes how to acquire the measured/computed data and how to save the data to the external storage medium.
10	**Set Differential Pressure Compensation Parameters** Describes how to set differential pressure compensation in the process of flow use.
11	**Setting Report Parameters** Describes how to set report parameters.
12	**Communication Function** Describes how to use the optional computation function.
13	**Initializing Data** Purge the accumulation and alarm report, resume factory setting.
14	**Specifications** Lists the specifications of the Paperless Recorder.

Conventions Used in this Manual

1. Unit

K	Denotes”1024”
k	Denotes”1000”
M	Denotes“1024K”
G	Denotes“1024M”
B	“Bytes”

2. Symbols (The following symbols are used in this manual)

WARNING	Describes precautions that should be observed to prevent injury or death to the user.
CAUTION	Describes precautions that should be observed to prevent damage to the instrument.
Note	Provides important information for the proper operation of the instrument.

3. Notation regarding procedures

The following symbols are used during the explanation of operation

[ ] ..... Represent key’s name. Example: [Page] [En]

『』 ……. Indicate a reference item. Example: 『Input Channel Setting』

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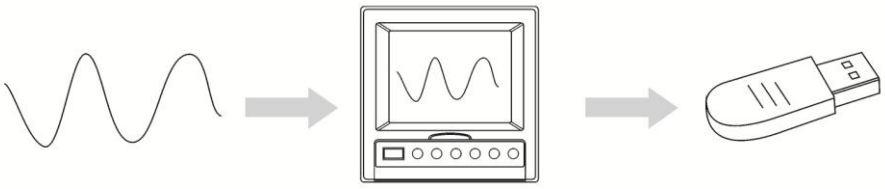
Chapter 1 Overview of Functions

1.1 Overview of the Instrument

Unlike conventional record that record data on charts, the Instrument displays the measured data acquired in the internal memory to a LCD in the form of waveforms, numerical values, and bar graphs. The measured data can also be saved to external storage media such as U Disk.



The data that have been saved to an external storage medium can be displayed on a PC using the standard software that comes with the package.
By using the RS232C or RS485 interface that comes standard with the Instrument, the data can be transferred to a PC (client function).

1.2 Functions of the Input Section

Number of Measurement Channels/Scan Interval

The number of measurement channels can be selected from 1~16.
The scan interval of measurement is 1 second.

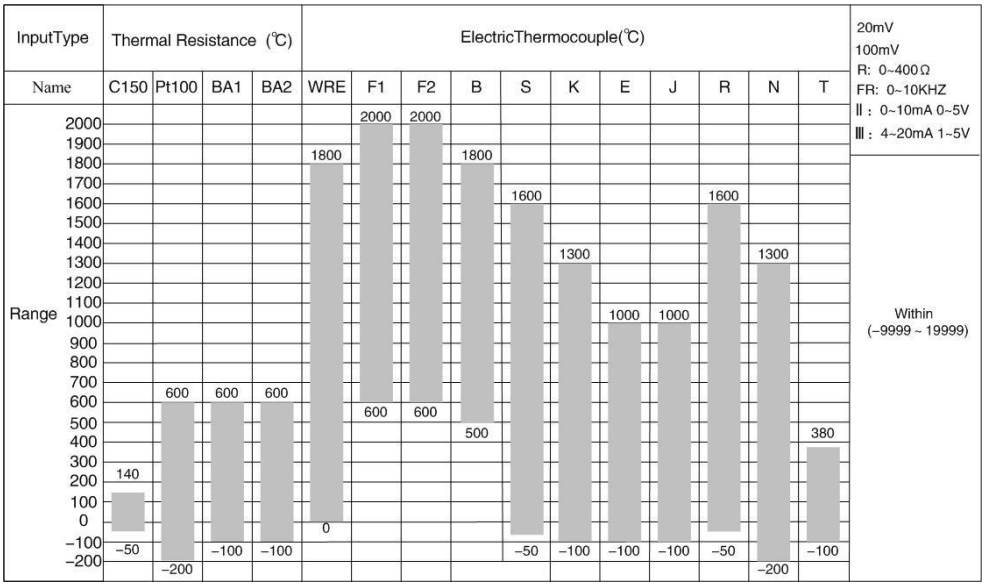
Input Type and Computation

You can select the input type of a measurement channel as follows. You can also perform computation on the measured data such as the "square root," and "small signal cutting."
For the procedure related to setting the different modes, see section 『System Configurations』

Input Mode	**Signal Type**
DC current	0–10mA 4–20mA
DC voltage	0–20mV 0–100mV 0–5V
Resistance	0 – 400Ω
Thermocouple	S, B, K, T, E, J, R, N, F1, F2, WRE
RTC	PT100, Cu50, BA1, BA2
frequency	0 – 10000Hz

Input Range and Measurable Range

You can select the "Input range" that is appropriate for the input signal for "DC current," "DC voltage," "Resistance," "Thermocouple," "RTD," and "Frequency." For each "Input range," a measurable range is defined.



Burnout

When measuring temperature with a thermocouple / thermal resistence / 4-20mA / 1-5V signal, the instrument provides check burnout function.you can specify the measurement result to be set to maximum of measurable range, minimum of measurable range, last value or Error Flag*1. For the setting procedure, see section『Burnout』.

*1 when the burnout setting is Error Flag, the measured value is indicated as "#####".

Reference Junction Compensation (RJC)

When measuring the temperature using a thermocouple, the reference junction compensation can be used. Reference junction compensation current is installed. You can adjust the temperature that measured by the instrument. For the setting procedure, see section 6.6.

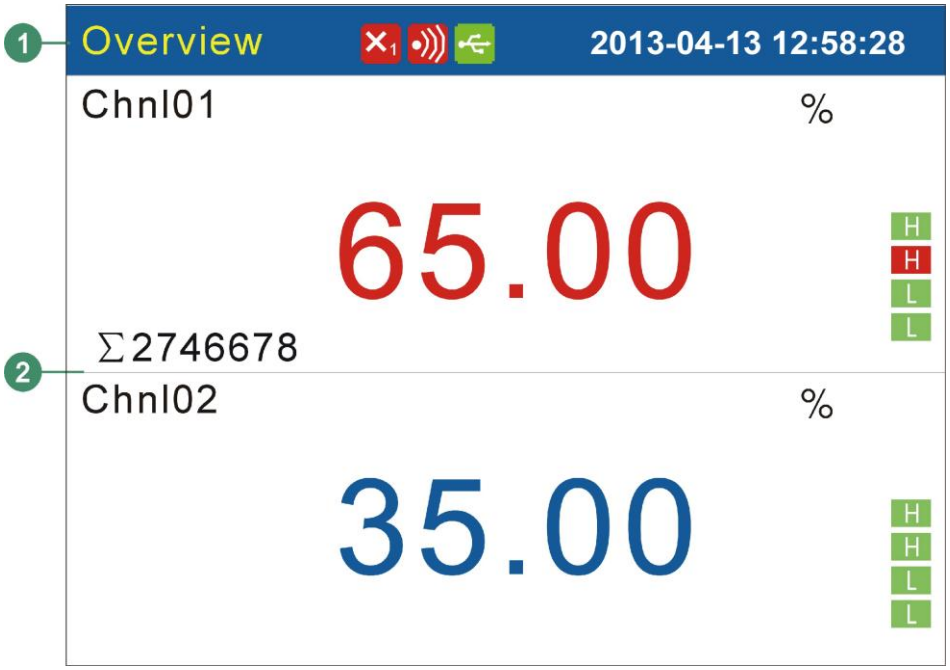
Filter

The filter is used to suppress the effect noise that is riding on the signal. Filtering is provided on the standard products. The filter can be set on each channel. For the setting procedure, see section 6.4.

1.3 Display Function

Common Items Related to the Display
TFT Color LCD and the Screen Configuration

The instrument has a 5.6” TFT color LCD (234-by-320 dot resolution). The screen consists of the status display section and the data display section.



Status Display Section

Display the displayed screen name, date and time, I/O boards running condition, alarm condition, USB device condition (option), cycle display condition, and history trend condition. For details, see section 4.2.

Data Display Section

Display the operation screen such as the trend display, digital display, and bar graph display of the measured and alarm summary, print operation, and backup operation.
Display the setup screen for the setting mode when the Instrument is being configured. For details related to the setting mode, see section 3.4.

Group Display

The data displayed on the trend displays are the data of measurement or computation channels that are assigned to the group. Up to 4 channels can be assigned to a single group. For the procedure used to assign channels to groups, see section 5.4. Up to four groups can be registered. The groups are common to the trend displays. On the trend displays, the displayed groups can be automatically switched at 10s intervals.

Run Mode

This mode is used for daily operation.
This mode is entered when the power is turned ON.
Displays various operation screens such as digital, bar graph, trend, historical trend, alarm summary, data print(option), and data backup display (option). Screens are switched by the PAGE key.

Setting Mode

The various functions of the instrument are configured using the setting mode.
This screen is used to set the input range, filter, alarm, group, etc.

1.4 Storage Function

The measured/computed data are first acquired to the instrument's internal memory as display data. Then, the data are saved to the external storage medium manually when the external storage medium is inserted into the drive.
The capacity of the internal memory for acquiring display data is 6 MB. For detail, see sections『 Date Saving and Saving to External Storage Medium』

External Storage Media and Internal Memory

The capacity of the internal memory for acquiring display data is 6 MB.
Various data can be saved to the U disk. The capacity is from 256MB to 1GB.

Scan Interval and Saving Interval

The scan interval of signal is fixed at 1s. The measuring and computing are completed in every scan interval. Display data is generated by these data.
All measured or computed data sampled can be saved to internal memory by saving interval.

Saving Data to Internal Memory

The display data are saved to internal memory continuously by saving interval.
If the instrument is unplugged, the data that lost while unplugged will be complemented by '0' when the power is turned ON.

Saving Data to External Storage Media

Insert the storage medium to the drive when data is to be saved (referred to as manual save.

1.5 Alarm Function

This function generates an alarm when the measured/computed data meets a certain condition. When an alarm occurs, information notifying the alarm occurrence is displayed on the screen. In addition, a signal can be output from the relay output terminals on the rear panel of the instrument (Option). For details, see section 『Setting Alarms』.

Alarm Indication

The alarm conditions are displayed as alarm icons in the status display section and through the trend, bar graph, overview and other screens. The detailed information about the alarms is displayed in the alarm summary.

Number of Alarms

You can set up to four alarms for each channel.

Alarm Conditions

The following eight conditions are available:

- High high alarm (HH)

An alarm occurs when the measured value exceeds the alarm value.

- High alarm (H)

An alarm occurs when the measured value exceeds the alarm value.

- Low alarm (L)

An alarm occurs when the measured value falls below the alarm value.

- Low low alarm (LL)

An alarm occurs when the measured value falls below the alarm value.

Alarm Hysteresis

This applies to ultra upper (HH), upper (H), lower (L) and ultra upper (LL) limit alarms on measurement channels. A width (hysteresis) can be specified on the value used to set or release the alarm. This prevents the alarm from being set or released repetitively when the measured value is fluctuating around the alarm value. About setting the hysteresis, see section 7.2.

Alarm Output Relay

If you are using a model with the optional alarm output relay, a contact signal can be generated according to the alarm conditions. For the procedure related to setting the alarm output relay, see section 7.2, “Alarm Setting.” For details, see section 7.1.

Delay Alarm

An alarm occurs when the measured value remains above or bellows the alarm value for the specified time period (delay period).

1.6 Computation Function (Option)

The Accumulation computation can be performed.

Accumulation Computation

The accumulation computation is performed every second.
The accumulation computation can be performed on each measurement channel.
For detail, see section『Accumulation Setting』

1.7 Analog Output Function (Option)

Measured and Computed data can be transmitted and output as an analog signal.

Transmitter Output

The signal type of transmitter output is 4-20mA.
The instrument provides 4 channels transmitter output. The maximum load of each channel can be drover is 750Ω.
For detail, see section『Analog Outputs Setting』

1.8 Communication Functions (Option)

The instrument can communicated with PC via serial cable. And also can print data or trend by micro printer.

RS232C/RS485 Interface

RS232C or RS485 can be select when the instrument communicates with PC.
By using the MODBUS-RTU protocol, measured/computed data written to the instrument's input register can be read by the PC.
The OPC software also provides for users, you can use it to connect the general HMI software like iFix, inTouch. Etc.

Micro Printer

History Data, History Trend and Display Data can be printed using micro printer.
You can print history data and history manually.
Print display data will be automatic.

1.9 Other Functions

24 VDC Power Supply for Transmitter (Option)

Provide 24 VDC power to transmitters.
The instrument provides 4 channels power supply. The maximum current of each channel can be provided is 60mA.

Chapter 2 Before Using the Instrument

2.1 Precautions on the Use of the Instrument

Read the following precautions before using the instrument and the external storage medium (U disk).

Handling Precautions

- Be careful when cleaning the instrument, especially any plastic parts. When cleaning, wipe with a dry, soft cloth. Do not use chemicals such as benzene or thinner, since these may cause discoloring and deformation.
- Keep electrically charged objects away from the instrument as this may cause malfunction.
- Do not apply volatile chemicals to the LCD monitor or panel keys. Do not allow rubber and vinyl products to remain in contact with the instrument for long periods of time. This may damage the instrument.
- Do not apply shock to the instrument.
- When not in use, make sure to turn OFF the power switch.
- If there are any symptoms of trouble such as strange odors or smoke coming from the instrument, immediately turn OFF the power and unplug the power cord. Then, contact your dealer or us.

Handling precautions of external storage media

- Take special care in handling external storage media as they are delicate products. For general precautions, see the instruction manual that came with the external storage medium.
- U disks may not operate properly under high or low temperature environment. If you are using the instrument in a low-temperature environment (less than 10 C), let the instrument warm-up for at least 30 minutes beforehand.
- If you are using them in a high-temperature environment (greater than 40 C), we recommend the external storage medium be inserted into the drive when saving the data and be removed after the data have been saved.
- Remove the external storage medium from the drive when turning ON/OFF the instrument.
- Do not remove the external storage medium while the access lamp is lit. Doing so can destroy the data on the medium.
- If you are using a commercially available U disk on instruments in the USB port, be careful of static electricity. The instrument may not operate properly if you touch the U disk that is inserted into the instrument when your body is charged with static electricity.

2.2 Installing the Instrument

Installation location

Install the instrument in a location that meets the following conditions.

- Instrument panel
  The instrument is designed for panel mounting.
- Well-ventilated location
  To prevent overheating, install the instrument in a well-ventilated location. For the panel mount type, see section『Dimensional Drawings』
- Minimum mechanical vibrations
  Choose an installation location with the minimum mechanical vibration.
- Horizontal
  Install the instrument horizontally (However, the instrument can be inclined up to 30 degrees backwards for panel mounting).

Note

- Condensation may occur if the instrument is moved to another place where both the ambient temperature and humidity are higher, or if the temperature changes rapidly. In addition, measurement errors will result when using thermocouples. In this case, let the instrument adjust to the new environment for at least one hour before using the instrument.
- The lifetime of the LCD may be shortened if the instrument is used in a high-temperature environment over a long period of time. When installing the instrument in a high-temperature environment (greater than 40℃), we recommend the backlight brightness of the LCD be set to a low setting.

Do not install the instrument in the following places:

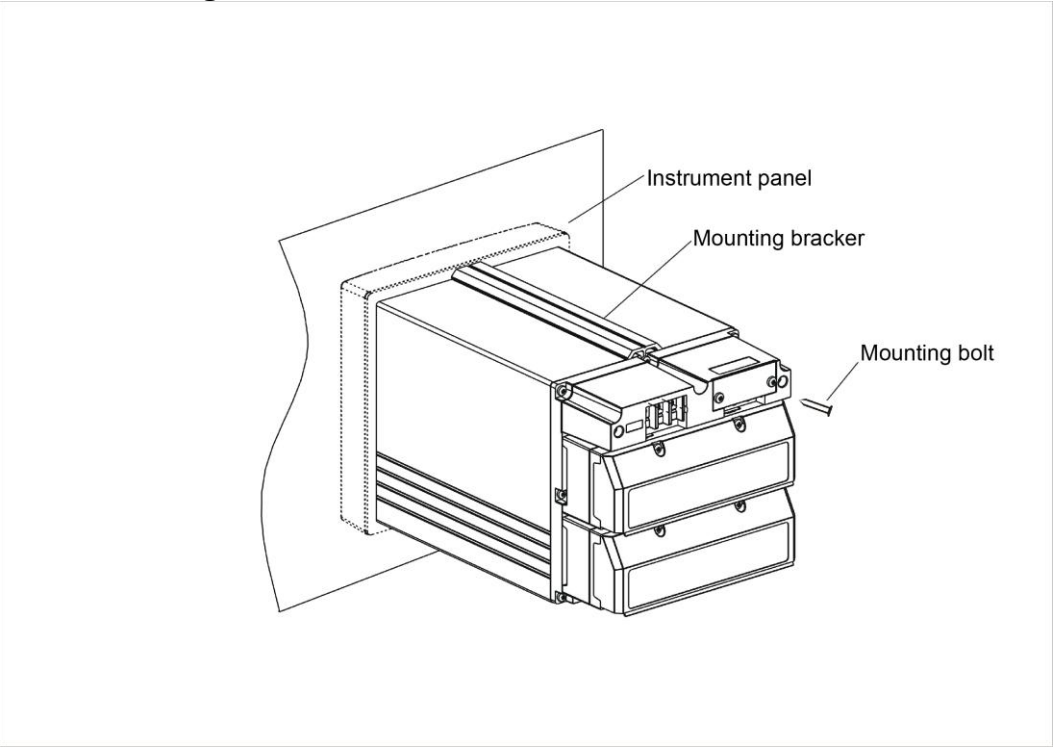
- In direct sunlight or near heat sources
  Install the instrument in a place with small temperature fluctuations near room temperature (23 C). Placing the instrument in direct sunlight or near heat sources can cause adverse effects on the internal circuitry.
- Where an excessive amount of soot, steam, moisture, dust, or corrosive gases are present
  Soot, steam, moisture, dust, and corrosive gases will adversely affect the instrument. Avoid such locations.
- Near strong magnetic field sources
  Do not bring magnets or instruments that produce electromagnetic fields close to the instrument. Operating the instrument in strong magnetic fields can cause errors in the measurements.
- Bad angle for viewing the screen
  Because the instrument uses a 5.6” TFT color LCD, it is difficult to view the display from an extreme angle. Please install the instrument so that the monitor can be viewed from the front.

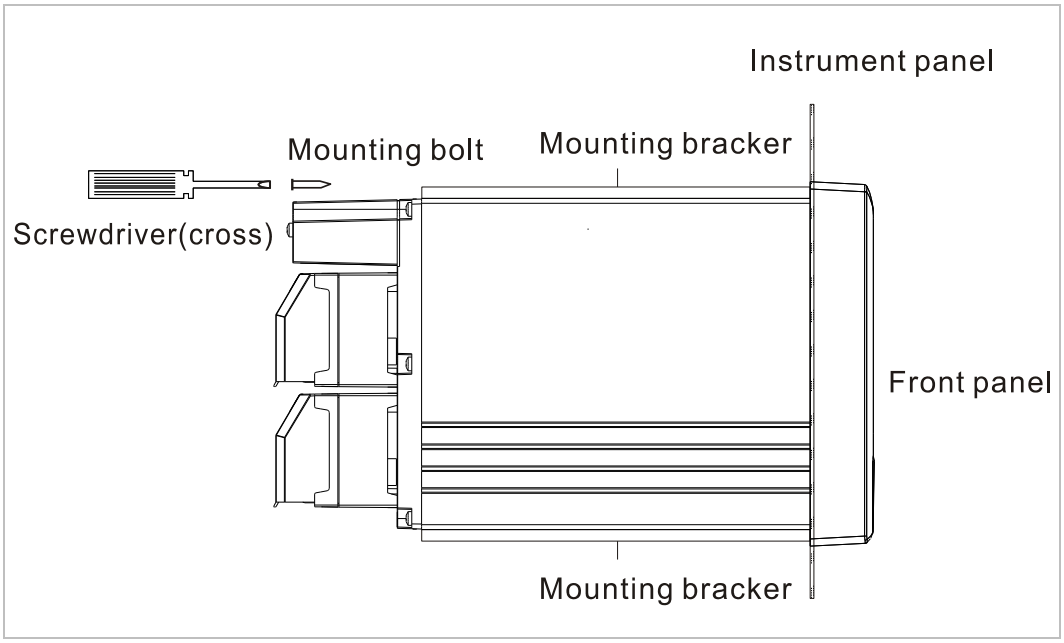
Installation Procedure (Panel Mount Type)

The instrument should be mounted on a steel panel of thickness 2 mm to 26 mm.

1. Insert the instrument from the front side of the panel.
2. As shown in the figure below, mount the instrument to the panel using the mounting brackets that came with the package.
3. Use two brackets to support the top and bottom sides of the case.

Panel Mounting





2.3 Input and Output Signal Wiring

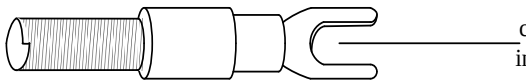
CAUTION

If a strong tension is applied to the cable wired to the instrument, the terminals of the instrument and/or the cable can be damaged. In order to prevent tension from being applied directly on the terminals, fasten all wiring cables to the rear of the mounting panel.

Precautions to be taken while wiring

Take the following precautions when wring the input signal cables.

It is recommended that crimp-on lugs (designed for 4 mm screws) with insulation sleeves be used on the lead wire ends.



crimp-on lugs (designed for 4 mm screws) with insulation sleeves be used on the lead wire ends.

Take measures to prevent noise from entering the measurement circuit.

- Move the measurement circuit away from the power cable (power circuit) and ground cable.
- It is desirable that the item being measured does not generate noise. However, if this is unavoidable, isolate the measurement circuit from the item. Also, ground the item being measured.
- Shielded wires should be used to minimize noise caused by electrostatic induction. Connect the shield to the ground terminal of the instrument as necessary (make sure you are not grounding at two points).
- To minimize noise caused by electromagnetic induction, twist the measurement circuit wires at short, equal intervals.
- Make sure to earth ground the protective ground terminal through minimum resistance (less than 100 Ω).

When using the thermocouple input, take measures to stabilize the temperature at the input terminal.

- Always use the input terminal cover.
- Do not use thick wires which may cause large heat dissipation (cross sectional area 0.5 mm2 or less recommended).
- Make sure that the ambient temperature remains reasonably stable. Large temperature fluctuations can occur if a nearby fan turns ON or OFF.

Connecting the input wires in parallel with other devices can cause signal degradation, affecting all connected devices.

If you need to make a parallel connection, then

- Ground the instruments to the same point.
- Do not turn ON or OFF another instrument during operation. This can have adverse effects on the other instruments.
- RTD cannot be wired in parallel.

WARNING

- To prevent electric shock, ensure the main power supply is turned OFF.

CAUTION

- Do not apply input signals that exceed the following values. This can damage the instrument.

1. Maximum input voltage
   Voltage range of 0.2 VDC or less or thermocouples: ±5 VDC
   Voltage range between 2 and 10 VDC: ±12 VDC
2. Maximum common mode noise voltage
   250 VACrms (50Hz)

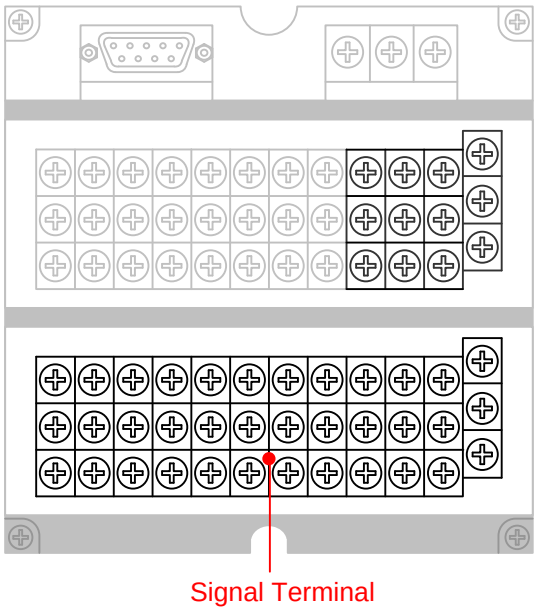
Wiring Procedure

1. Turn OFF the instrument and remove the input terminal cover.
2. Connect the input signal wires to the input terminals.
3. Replace the input terminal cover and fasten it with screws.

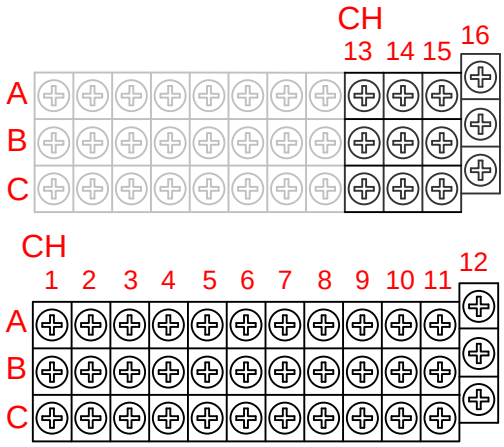
NOTE

- For clamped input terminals, the following wires are recommended.
  Cross sectional area of the conductor or conductors
- Single conductor: 0.14 mm2 to 1.5 mm2
- Stranded conductors: 0.14 mm2 to 1.0 mm2
  Stripped cable length: approximately 5 mm
- Input signal wires of diameter less than or equal to 0.3 mm may not be secured firmly for clamped input terminals. Fold over the conducting section of the wire, for example, to make sure that the wire is securely connected to the clamped input terminal.

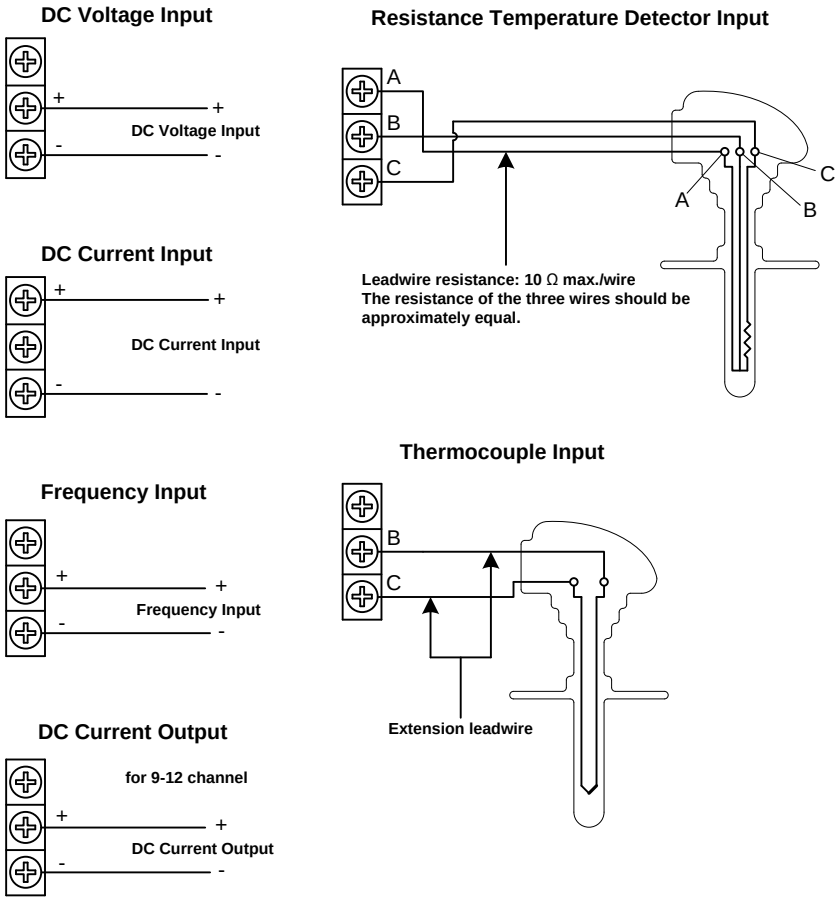
Signal Terminal Position



Terminal Arrangement



Wiring Diagram



2.4 Alarm Output Wiring (Option)

WARNING

- To prevent electric shock, ensure the main power supply is turned OFF.
- If a voltage of more than 30 VAC or 60 VDC is to be applied to the alarm output terminal, use ring-tongue crimp-on lugs with insulation sleeves on all terminals to prevent the wires from slipping out when the screws become loose. Furthermore, use double-insulated wires (dielectric strength of 2300 VAC or more) for the signal wires on which a voltage of more than 30 VAC or 60 VDC is to be applied. For all other wires, use basic insulated wires (dielectric strength of 1350 VAC). To prevent electric shock, attach the terminal cover after wiring and make sure not to touch the terminals.

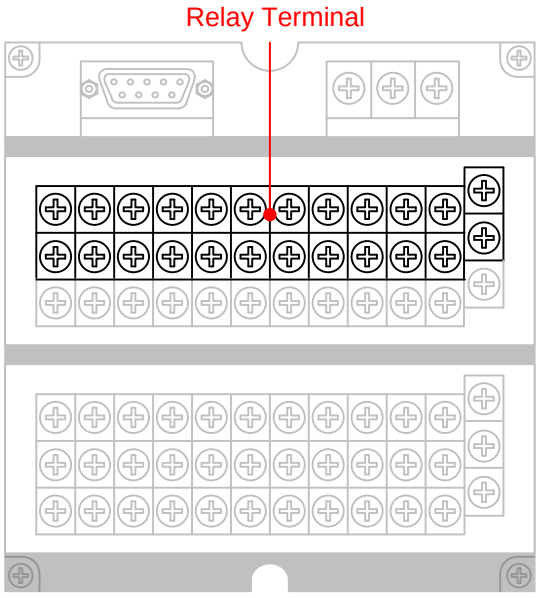
Wiring Procedure

1. Turn OFF the instrument and remove the cover for the option terminal.
2. Connect the alarm output cables to the terminal.
   The terminal arrangement will be one of the figures shown on the next page depending on the alarm output relay option (number of outputs).
3. Replace the terminal cover and fasten it with screws.

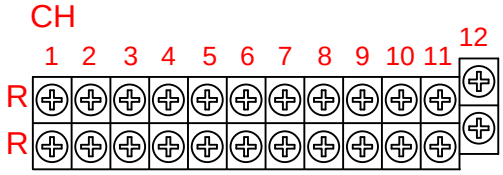
CAUTION

To prevent fire, use signal wires having a temperature rating of 70 ℃ or more.

Alarm Terminal Position



Terminal Arrangement



Contact Specifications

Item	Specification
Output Type	Relay transfer contact (energize/de-energize switchable)
Output capacity	250 VAC (50 Hz), 3 A 30 VDC, 3 A (resistive load)
Dielectric strength	500 VAC (50 Hz) for one minute between output terminals and the ground terminal

2.5 Input Digital Signal Wiring (Option)

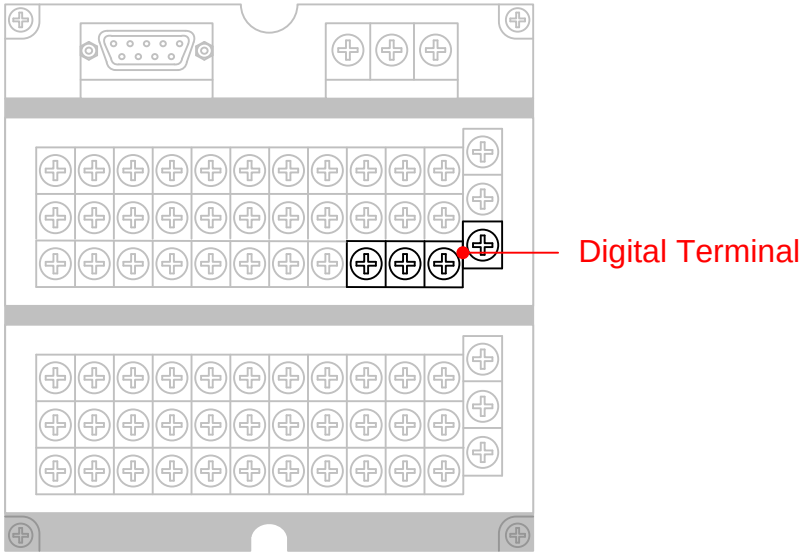
Wiring Procedure

1. Turn OFF the instrument and remove the cover for the option terminal.
2. Connect the alarm output cables to the terminal.
3. Replace the terminal cover and fasten it with screws.

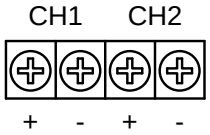
CAUTION

To prevent fire, use signal wires having a temperature rating of 70℃ or more.

Digital Input Terminal Position



Terminal Arrangement



Contact Specifications

Item	Specification
Input signal	Voltage-free(dry)contact, open-collector(TTL or transistor)
Input conditions	Signal width： above 250ms Input voltage： ON： 4VDC – 24VDC OFF： 0VDC – 1VDC
Input type	Photocoupler isolation(one side common) Internal isolation power source (24VDC±5%)
Dielectric strength	30VDC for one minute between input terminals and the ground terminal.

2.6 Connect Power Supply

Precautions to be taken when wiring the power supply

To prevent electric shock and damage to the instrument, observe the following warnings.

WARNING

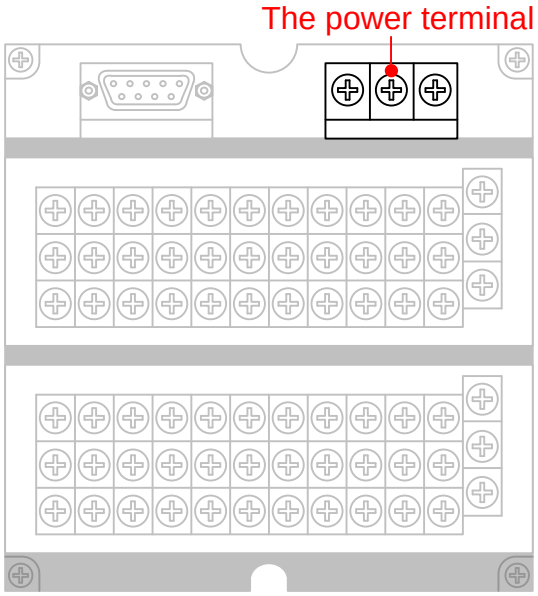
- To prevent electric shock, ensure the main power supply is turned OFF.
- To prevent the possibility of fire, use 600 V PVC insulated wire (AWG18) or an equivalent wire for power wiring.
- Make sure to earth ground the protective earth terminal through a grounding resistance less than 100 Ω before turning ON the power.
- Use crimp-on lugs (designed for 4mm screws) for power and ground wiring termination.
- Make sure to provide a power switch (double-pole type) on the power supply line in order to separate the instrument from the main power supply. Put an indication on this switch as the breaker on the power supply line for the instrument.

  Switch Specification Rated current: 3A or more
- Connect a fuse (between 2A and 15A) to the power line.

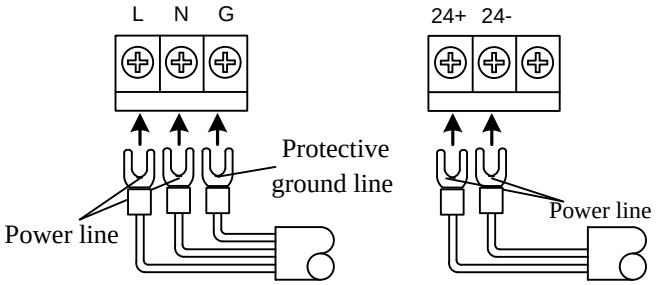
Wiring Procedure

1. Connect the power supply wires and the protective ground wire to the power terminals.
2. Replace the terminal cover and fasten it with screws.

The position of power terminal:



Terminal Arrangement



Contact Specifications

Power Supply	Specification
220V	Input voltage： 85VAC ～ 265VAC Input frequency： 50Hz ～ 60Hz
24V	Input voltage： 24VDC

2.7 24VDC Transmitter Power Wiring（Option）

Transmitter power output

CAUTION

Never short-circuit the power supply terminals or apply an external voltage, otherwise damage to the instrument may result.

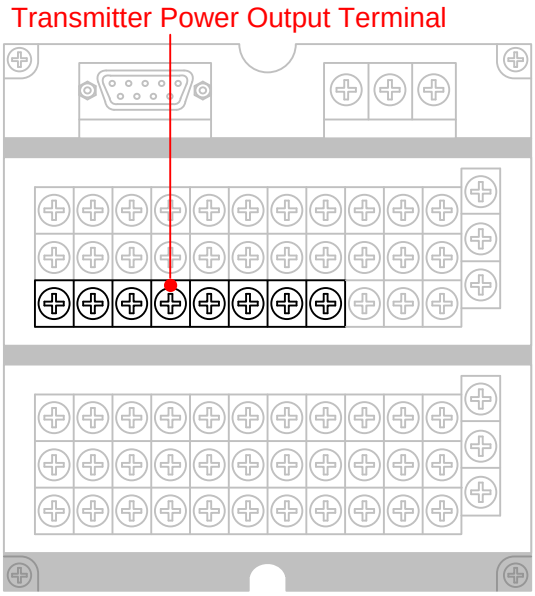
Wiring Procedure

1. Turn OFF the instrument and remove the cover for the option terminal.
2. Connect the alarm output cables to the terminal.
3. Replace the terminal cover and fasten it with screws.

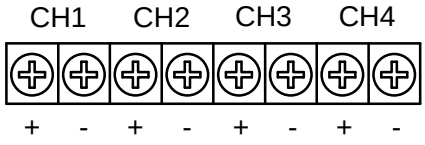
Note

Remove the cover for the option terminal can be expediently to wiring. To prevent contact badness, replace the terminal cover and fasten it with screws.

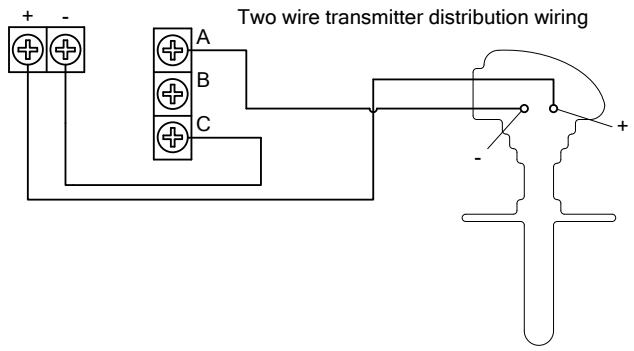
Transmitter Power Output Terminal Position



Terminal Arrangement



Wiring Diagram



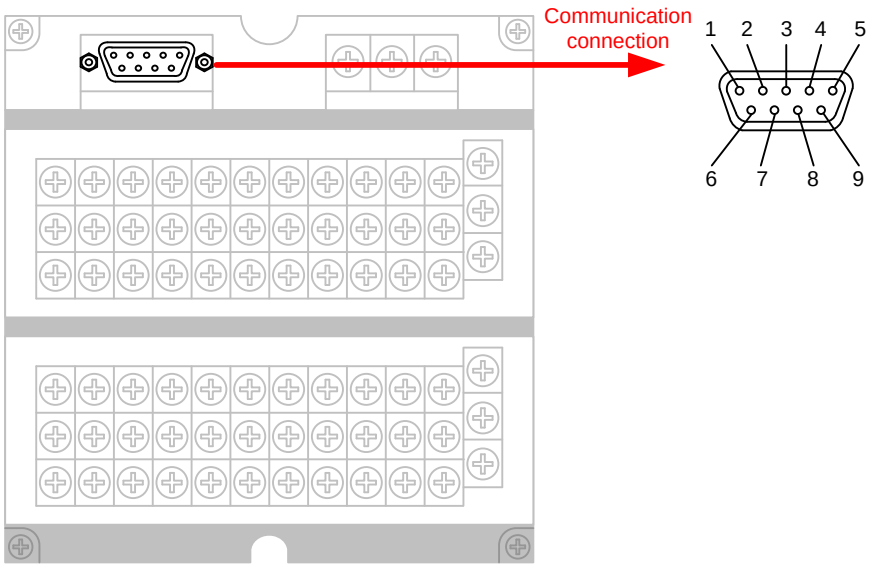
24VDC Transmitter Power Supply

Loop	4
Output voltage	22VDC ～ 25VDC（rate output current）
Maximum output current	65mADC（over-loading protect current: about 90mADC）
Maximum output current	RL≤(17 –minimum circulate voltage)/0.02A
There into	RL ≤ 750Ω 17V = 22V – 5V 22V：Minimum output voltage 5V：Maximum voltage drop（shunt resistance 250Ω）

2.8 RS232C/RS485 Communication Wiring (Option)

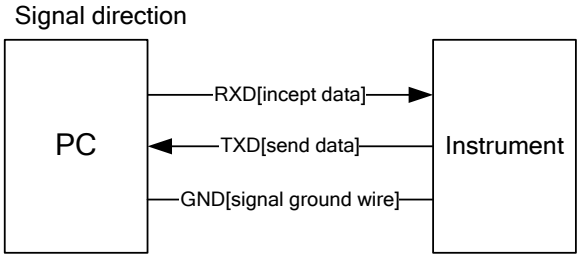
Wiring Procedure

RS232 Communication wiring position

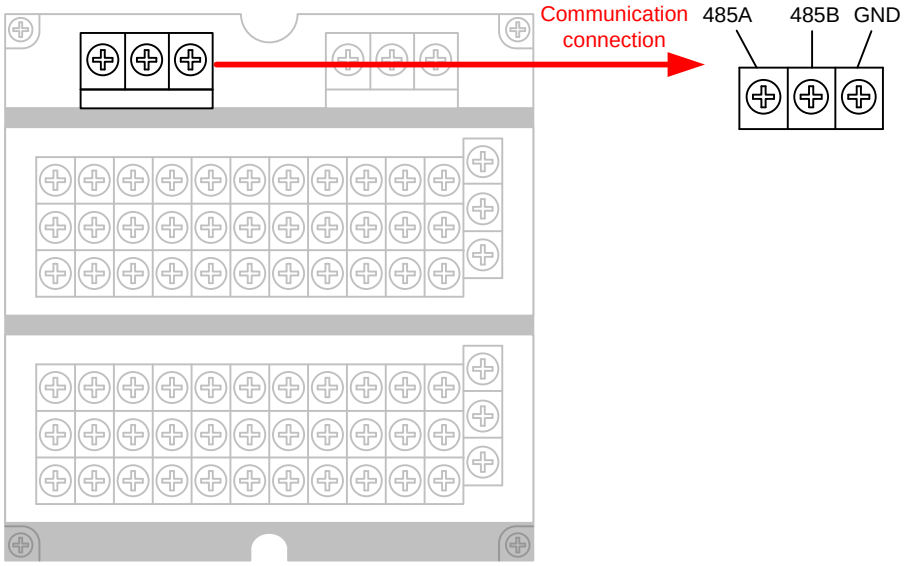


Pin number	Signal Name	Description
2	RXD	instrument receive data
3	TXD	instrument send data
5	GND	Signal Ground
7	485A	RS485 communication wiring +
8	485B	RS485 communication wiring -

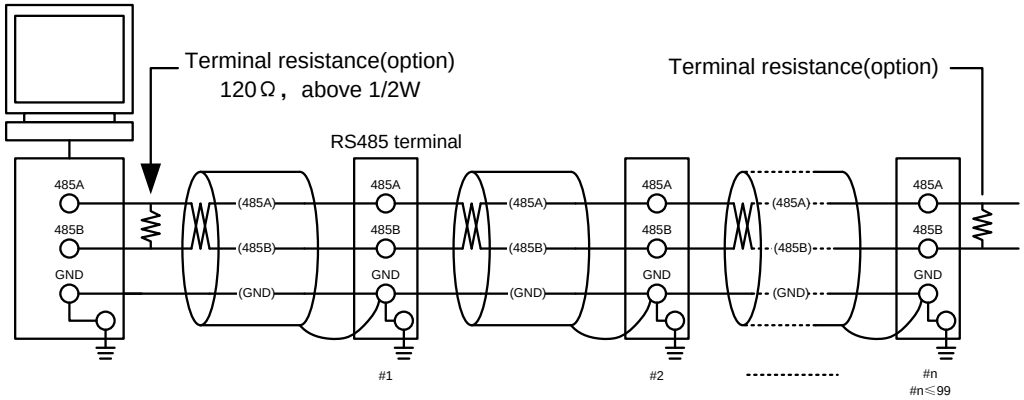
RS232C Wiring



RS485 Communication wiring position



RS485 Wiring



Don’t connect terminal resistance between #1 and #n-1

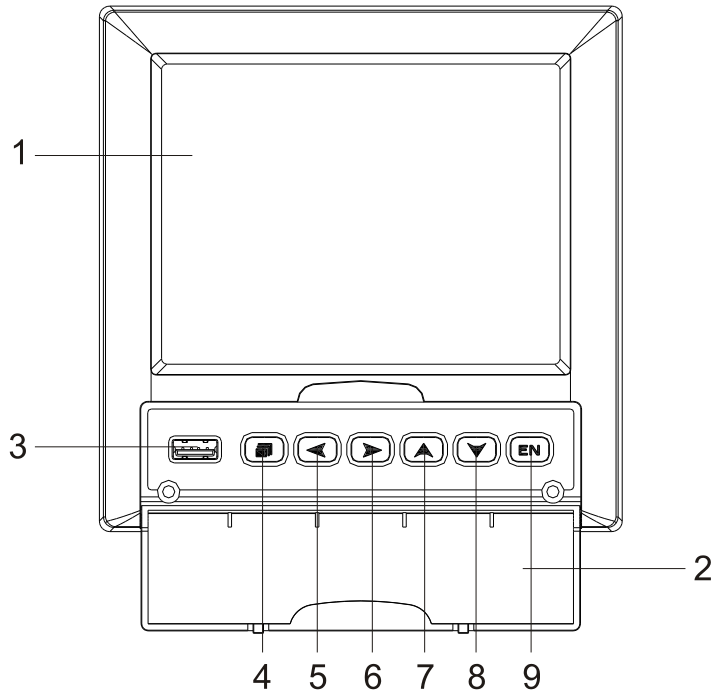
Communication Specifications

Item	Specification
Speed(baud rate)	1200/2400/4800/9600/19200/38400/57600
Data format	Eight data bits，One stop bit Optional checkout code（None/odd/even）

Chapter 3 Names of Parts/Run Mode/Common Operations

3.1 Names of Parts and Functions

Front Panel



1. **LCD Screen**
   Display various operation screens such as the trend display and the setup screen to configure the instrument.
2. **Front Cover**
   Open this cover to access the keys or inserting or removing the external storage medium such as the USB disk. Open the cover by catching the center of the top edge of the cover and pulling it toward you.
   Keep the cover closed at all times except when accessing the keys and the external storage medium.
3. **USB Port**
   USB Port is used to insert or remove the external storage medium such as the U disk.
4. **PAGE key**
   Used to switching operation display. Press this key down with ENTER key at the same time will becoming a combination key, used to enter the setting mode.
5. **LEFT key**
   Used to move cursor (blue) to left in run mode and setting mode. In continues mode of the history trend screen, used to scrolls the waveform along the time axis.
6. **RIGHT key**
   Used to move cursor (blue) to right in run mode and setting mode. In continues

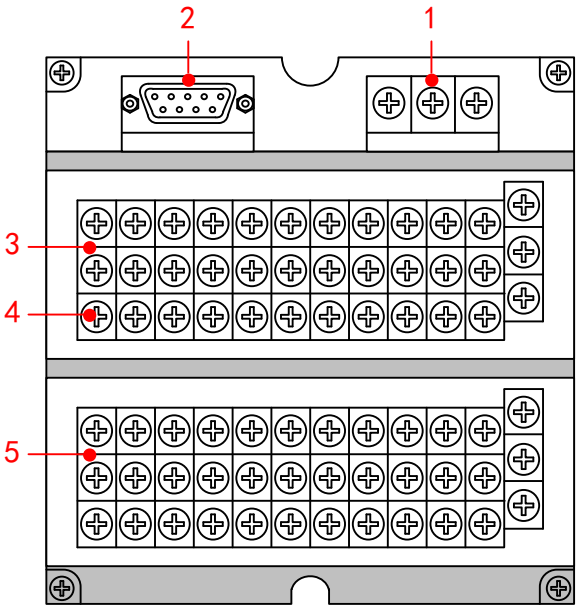
mode on history trend display, used to scrolls the waveform along the time axis.

7. **UP key**
   Used to increase the value that cursor indicated, and switches groups on the trend screen.

8. **DOWN key**
   Used to decrease the value that cursor indicated, and switches compress ratio on the history trend screen.

9. **ENTER key**
   Used to execute the function of button that cursor indicated. It also display the input keypad when the value that cursor indicated can be edited. On history trend screen, you can switch replay mode between continuous time mode and select time mode.

Rear Panel



1. **Power terminals**
   Connect the power cord.

2. **RS232 Port and RS485 Port**
   RS-232 port or RS485 port depend on the specification. Connect the interface cable.

3. **Relay terminals**
   Connect the relay output cable.

4. **24 VDC Power Supply for Transmitter**
   Provide 24 VDC power to transmitters.

5. **I/O signal terminals**
   Connect the input signal cable of the item being measured or output signal cable.

Note: For the details, please refer to 『Before using the instrument』 chapter.

3.2 Inserting/Removing the External Storage Medium

This section describes the procedures to insert and remove the external storage medium. USB disk is the only type of media can be used.
For the handling procedure of the storage medium, see section 9.2.

Procedure

Inserting the storage medium

1. Open the front cover. Insert the U disk into the USB port.
2. The instrument detects the existence of an external storage medium in the drive automatically. If the storage medium is detected, an external storage medium icon is displayed in the status display section of the screen.
3. Press PAGE key to display Backup screen, saving data to U disk. Success information will be displayed when backup ended.

CAUTION

- Keep the front cover closed during operation except when accessing the external storage medium. This will protect the storage medium and the drive from foreign particles such as dust.
- Keep the metal face upper when inserting the U disk, otherwise can't insert.
- If you are using a commercially available U disk, be careful of static electricity.

Removing the storage medium

If the instrument is turned ON, check that the storage medium is not being accessed.

CAUTION

- The access lamp is lit while the storage medium is being accessed.
- A message "Data are being saved to the medium." is displayed while data are being saved to the medium.

Specification

Formatting external storage media
Format the external storage medium before use.
Please use the PC to carry on the formatting for the USB flash drives, this product doesn't provide the formatted function.

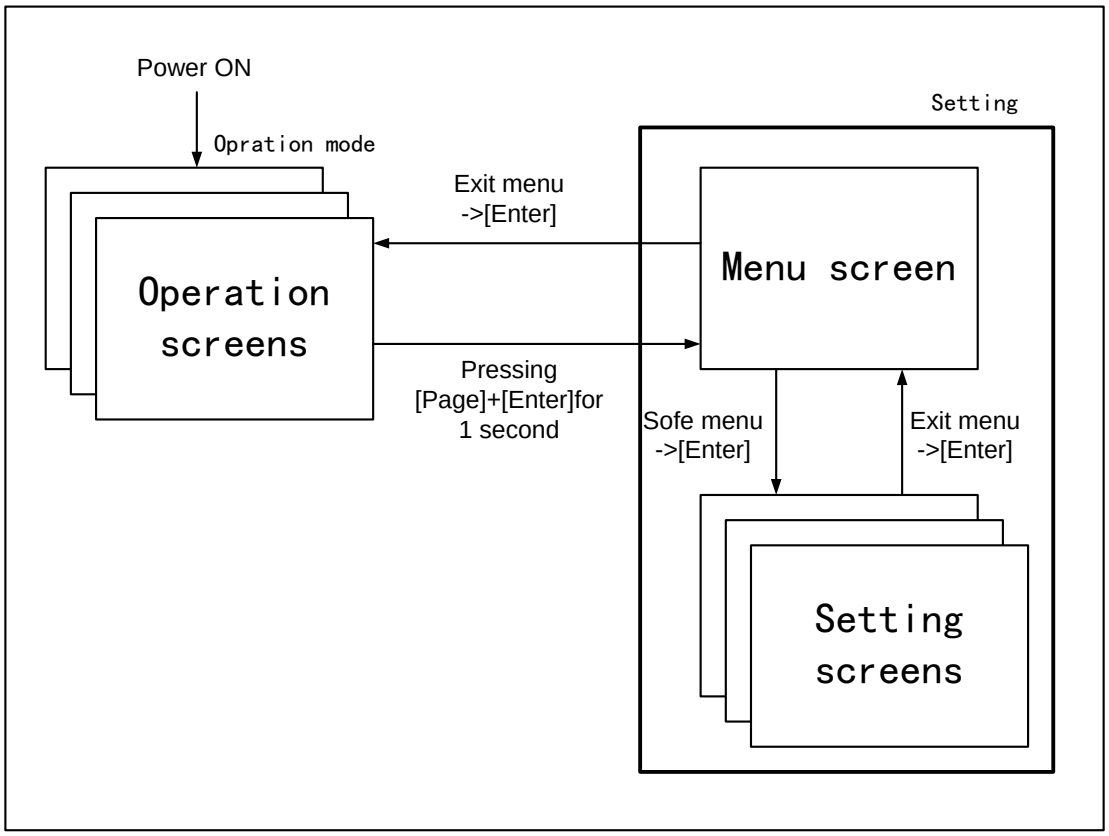
Option

Parameters	Item
USB port	The USB 2.0 agreement
Content	Maximum 4GB

3.3 Run Mode

There are two run modes: operating and setting. This section describes the functions and relationships of the two modes.

Mode Types



Mode Type	Description	Possible operations
Operation Mode	This mode is used for daily operation. This mode is entered when the power is turned ON. Back up data to the external storage.	Monitoring operation Data acquisition Data printing Operation related to the file on the external storage medium.
Setting Mode	This mode is used to configure the operation such as input range and alarms. This mode is entered by pressing the [Page] and [Enter] key for one second at the setting mode menu. Measured data can't be displayed in this mode. Operations such as measurements, alarm detection, and data acquisition are continued.	Settings of the functions.

Functions and Operations in the Operation Mode

Operation screen

Display various operation screens such as digital, trend, bar graph, historical trend, alarm summary, print and back up.
Screens are switched by the [Page] key. See section 4.1.

The operation screen with different key operating has the different functions. The concrete pressed key operation and the function please see section 4.1.

Functions of setting modes

Use arrow keys and [En] key to set the instrument's functions.
See sections 5.1 to 12.4.

3.4 Configuring the functions

Setting Mode

The setting mode is used to change the configuration of various functions.

CAUTION

Change some system parameters will affect the data acquisition. We suggest backing up data before the changed.

Setting Items

User can carry out the following content in configuration mode:

- System Configurations
- Setting Analog Inputs
- Setting Analog Outputs
- Setting Display Parameters
- Setting Report Parameters
- Setting Alarms
- Communication Function
- Print Function
- Initializing Data

3.5 Common key operations

This section describes common key operations which are used often.

Key operations in the setting mode

Entering the setting mode

1. Power on immediacy enter the setting mode
2. Select [Exit] to enter the setting mode in the configuration mode.

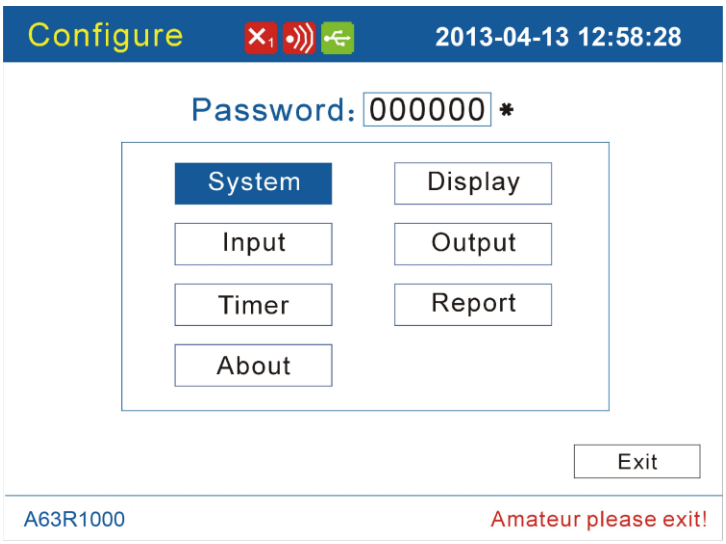
Switching the screens under the setting mode

Press [Page] to display each setting screen in turn.

Key operations in the configuration mode

Entering the configuration mode

1. Under the setting mode, Press [Page] and [En] to enter the configuration screen.
2. Move the cursor and press the [En] to enter each configuration screen.



Selecting the parameter

Used [Left] and [Right] to move the cursor (blue) to the appropriate parameter or operation key.

Confirming operation

Press [En] to confirm the settings.

Modifying the parameter

There are two types of the revisable parameters, select input parameter and edit input parameter.

- Selecting input parameter(The right of the input frame has the sign ⬍)

Used [Up] and [Down] to move the cursor to modify the appropriate parameter.

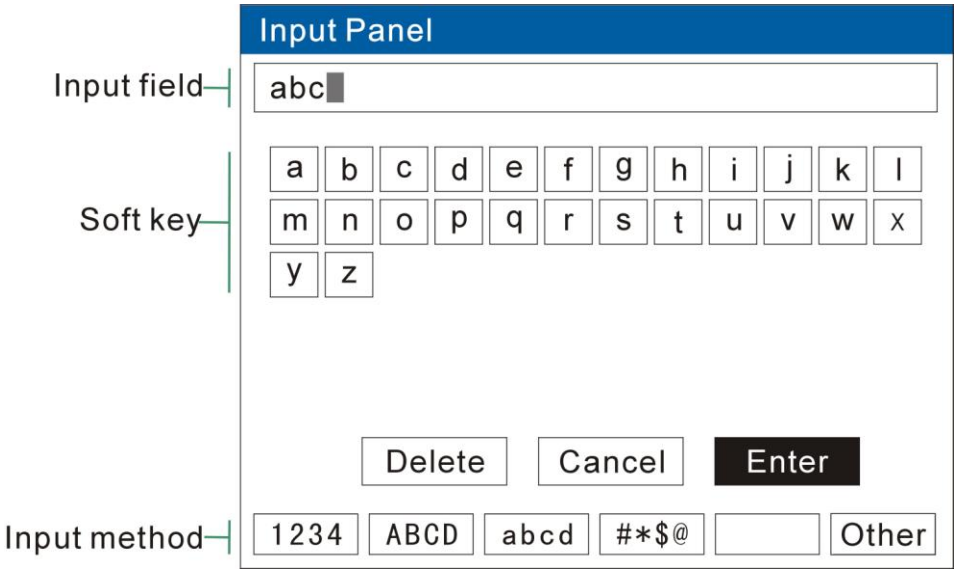
- Edit input parameter(The right of the input frame has no sign)

When the parameter can be edited, user can input Number, English (Caps), English, Symbol and Chinese.

Move the cursor to the edited parameter, press [En] to the input panel, user can do it.

Input Number/English (Caps)/English/Symbol

Used in inputting range, unit, tag etc.



Procedure

[Left][Right]：Move the cursor to the soft key or input method.

[Up][Down]：Move the cursor of the soft key.

[Page]：Switch the cursor's area.（Soft key /Input method）。

[En]： Input the character to the input field, which under the place of cursor.

Cursor at [Delete]：Delete the last character in the input field.

Cursor at [Cancel]：Exit the input panel, cancel the editing.

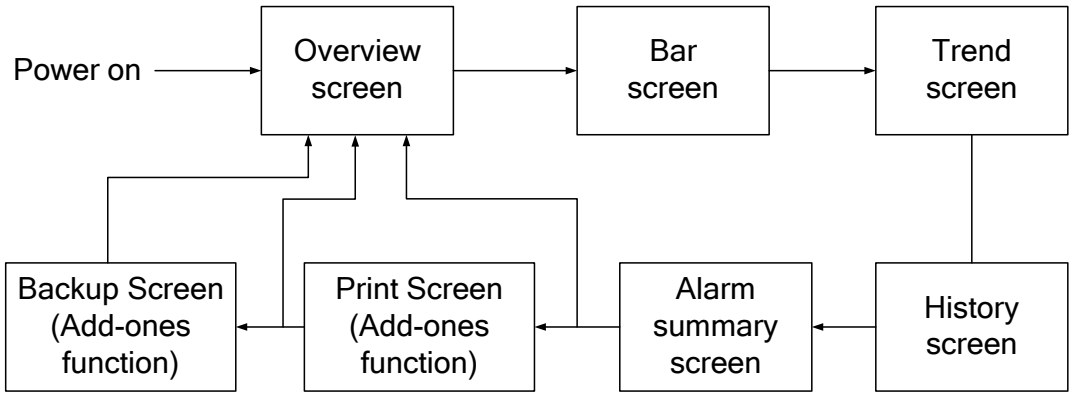
Cursor at [Enter]： Exit the input panel, confirm the editing.

If the cursor at the input method area, you can switch it to the soft key area.

Chapter 4 Switching Operation Screens

4.1 Switching operation screens

This chapter describes the screen (operation screen) used to display the measured / computed data.
The operation screens are composed of Overview, Bar, Trend, History, Alarm summary, Print (Add-ones function) and Backup (Add-ones function).
Used the [Page] key can switch each screen.



4.2 Explanation of the status Display Section

The following information is displayed in the status display section during the operation mode and the configuration mode.

1. **Screen name**
   Displayed the screen name, [Alias] is displayed during all channel display.

2. **Board card status flag**

None	Work normal
A	All Interior boards don't work
B	The board in Socket1 doesn't work
C	The board in Socket2 doesn't work

Note
When the instrument displayed this flag, there was something wrong with it, you should contact the Supplier.

3. **Alarm status flag**
   Alarm icon: Relay exports the alarm.
   None: Relay doesn't export the alarm.

4. **USB Equipment flag**

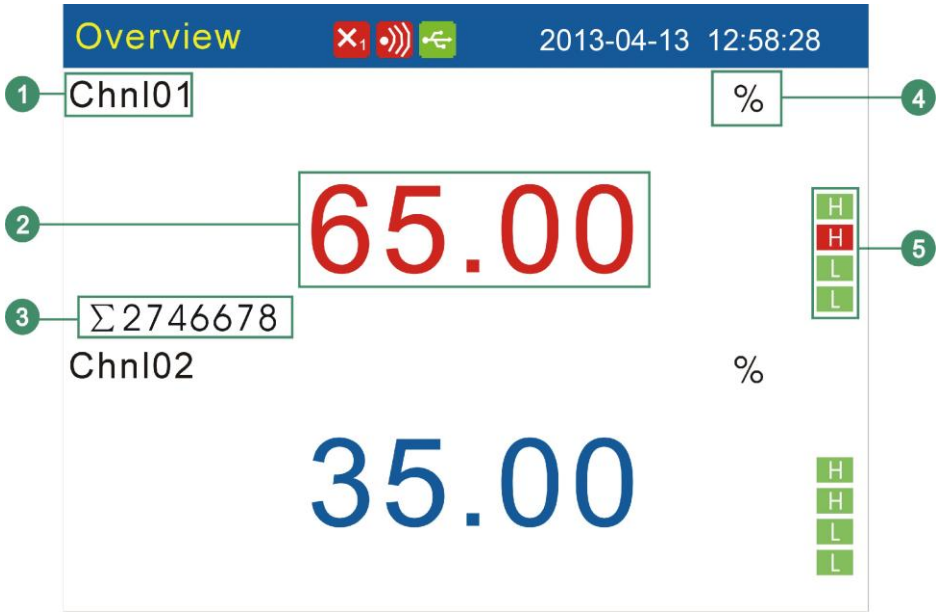
5. **Circulation display flag (Trend screen)**
   Circulation icon： Circulation Display each group
   None： Fixed screen, don't circulation.

6. **History trend status flag (History screen)**

None	Not in this screen
D	Continuous state
E	Fixed point state

7. **Current data and time**

4.3 Overview screen



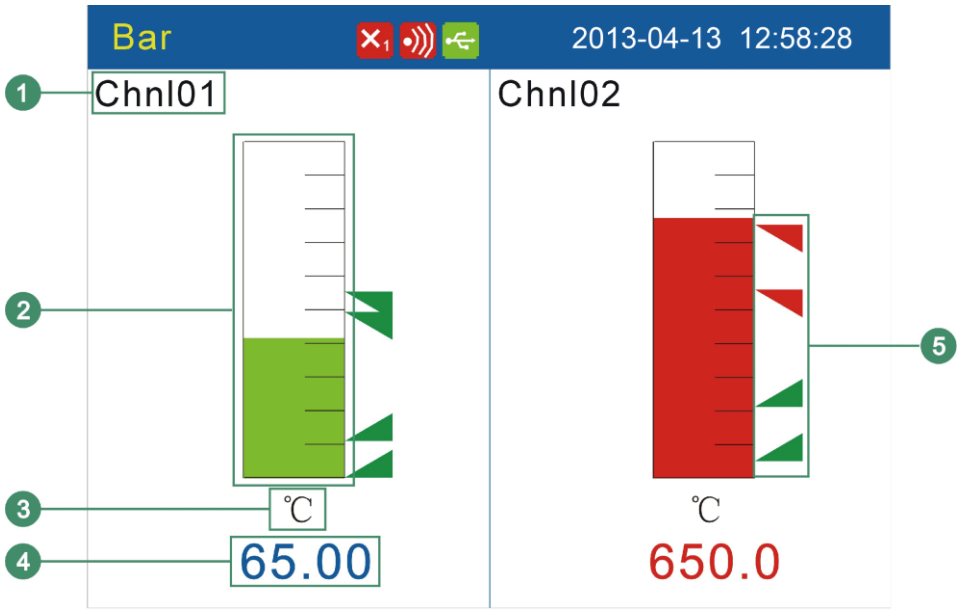
1. Channel tag. See section『Channel Tag and Unit Setting』
2. Engineering value. Blue is Normal, red is alarming

Note

- Measure the channel's data display
  When measuring data of measurement channel anomalies (see below), the screen shows measurements for #####.
- Data exception
  4-20 mA : signal bellows 2 mA.
  The thermocouple burnout , the [burnout set] display #####.

3. Channel accumulation value.
4. Channel unit. See section『Channel Tag and Unit Setting』
5. Alarm symbol. From up to down, high high alarm, high alarm, low alarm, low low alarm. Green is normal, red is alarm.

4.4 Bar Graph Display



1. Channel tag. See section『Channel Tag and Unit Setting』
2. Bar. Bar chart ruler has the length of 10 grids, and the length of filling color represents proportion in percent. Green is normal, red is alarm.
3. Channel unit. See section『Channel Tag and Unit Setting』
4. Engineering value .Blue is normal, red is alarm.

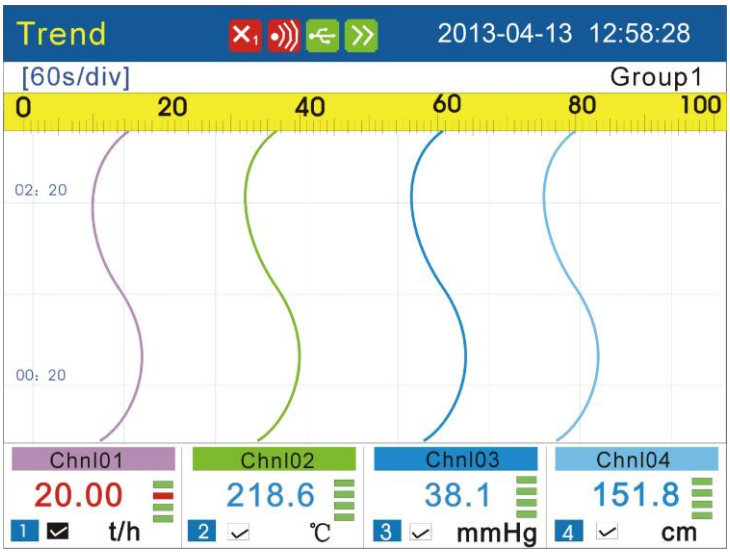
Note

- Measure the channel's data display
  When measuring data of measurement channel anomalies (see below), the screen shows measurements for #####.
- Data exception
  4-20 mA : signal bellows 2 mA.
  The thermocouple burnout , the [burnout set] display #####.

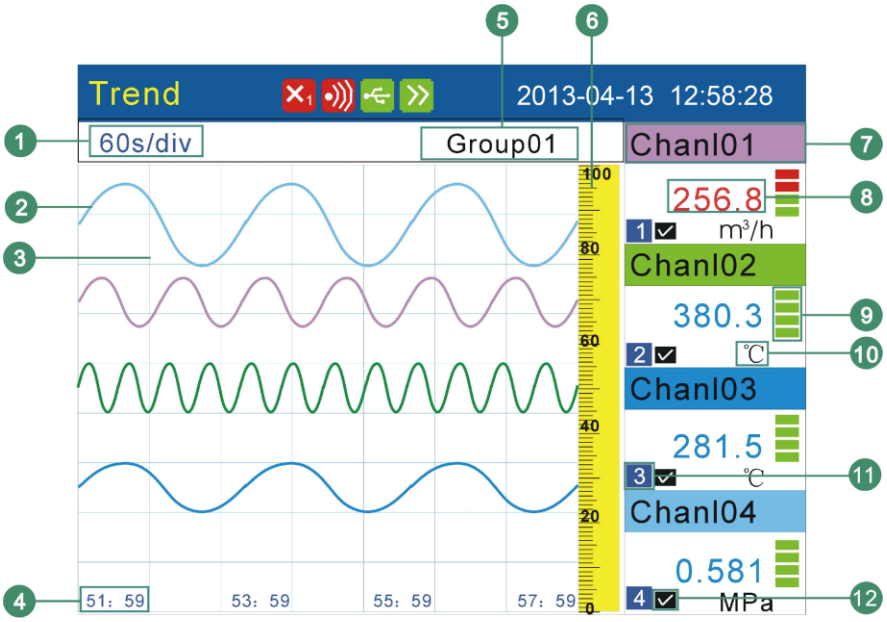
5. Alarm symbol. From up to down, high high alarm, high alarm, low alarm, low low alarm. Green is normal, red is alarm. Indications of each channel's alarm state.

4.5 Trend screen

Trend display（Vertical）



Trend display（Horizontal）



1. Trend cycle. Each grid means the length. The cycle is related with saving interval, each grid time length = saving interval ×30.
2. Data trend. Most display 4 trends at the same screen.
3. Grid. Estimate the time and data value.
4. Time of the current grid.
5. Trend combination. Display the name of the current combination.
6. Scale. Display the percentage the trend.
7. Channel tag. Background color and this corresponding trend color are identical.
8. Engineering value.

Note

- Measure the channel's data display
  When measuring data of measurement channel anomalies (see below), the screen shows measurements for #####.
- Data exception
  4-20 mA : signal bellows 2 mA.
  The thermocouple burnout , the [burnout set] display #####.

9. Alarm symbol. From up to down, high high alarm, high alarm, low alarm, low low alarm. Green is normal, red is alarm. Indications of each channel's alarm state.
10. Channel unit. See the section of『Channel Tag and Unit Setting』
11. Trend sequence number
12. Trend display symbol. "√" display, "×" hide.

Trends refurbish
On time axis of the instrument's LCD screen, every pixel stands for a record interval. Every record interval in trend moves once.

Group circulation
When started the circulation display function, switched to next group display trend for every 10 seconds.

Procedure

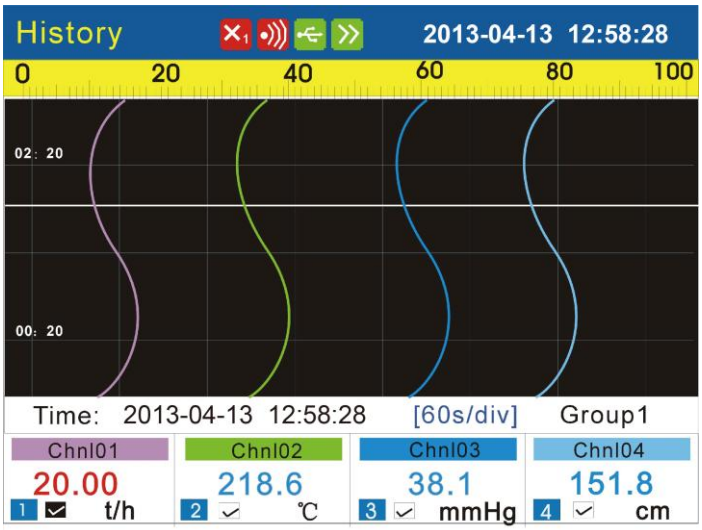
Switch trend display group
[Up] is used to switch to next effectual group display trend.

Circular display the trend display group
[En] is used to open or close display with circulation. When open this function, there will be an icon appeared in the state bar. See section『Explanation of the status Display Section』.

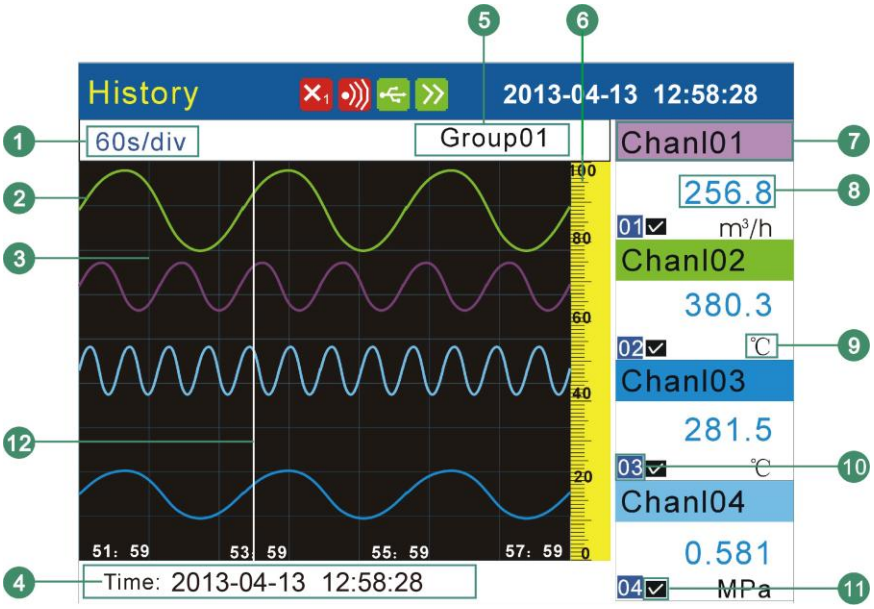
Display or hide a trend
Move the cursor (black) with [Left] and [Right] keys, pitch on the channel needing display or hide a trend, press [Down] to hide or display the trend.

4.6 History screen

Trend display（Vertical）



Trend display（Horizontal）



1. Trend cycle. Each grid means the length. The cycle is related with saving interval, Time length = saving interval ×Zoom multiple×30.
2. Data trend. Most display 4 trends at the same screen.
3. Grid. Estimate the time and data value.
4. Cursor time. The time of the trend.
5. Trend combination. Display the name of the current combination.
6. Scale. Display the percentage the trend.
7. Channel tag. Background color and this corresponding trend color are identical.
8. Engineering value.
9. Channel unit. See the section of『Channel Tag and Unit Setting』

10. Trend sequence number
11. Trend display symbol. “√” display, “×” hide.

Procedure

There exist two methods to search historical data. One is continuous and the other is fixed point.

The current state tag, please see section of『Explanation of the status Display Section』.

Switch the continuous state and the fixed point state

Under the continuous state, press [En] to switch to the fixed point state.

Under the fixed point state, press [En] to switch to the continuous state.

Continuous state

Switch channel trend

Within this state, uses [up] to display the next channel’s trend.

Trend zoom

Under the continuous state, press [Down] to switch the trend zoom times, circulation switch between 1 times/ 2 times/ 4 times/ 8 times/ 16 times/ 32 times.

Operation

Uses [Left] and [Right] to move cursor so that forward or backward searching is available.

The trend moves 1/3 screen trend voluntarily when the trend cursor remove arrives at screen border.

Fixed point state

Display or hide the trend

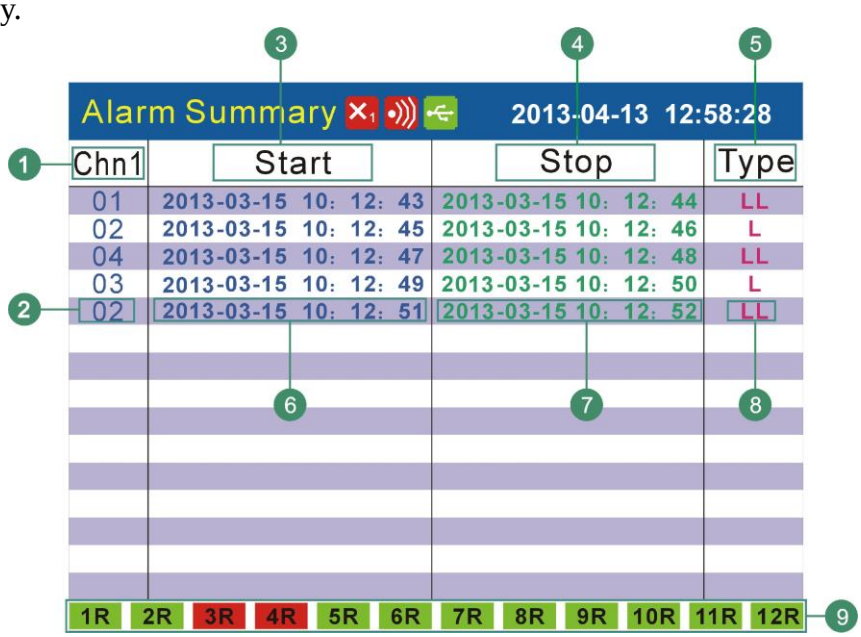
Within this state, uses [Left] and [Right] to move cursor (Black) and chooses the trend in channel to be displayed or hided by pressing [Down].

Operation

Uses [Left] and [Right] to move cursor. Set the data time to a desired point by using [Up] and [Down]. Press [En], the trend will be moved to the fixed point automatically.

4.7 Alarm summary

Displayed most 15 pieces alarm information, at the same time displayed the state of the relay.



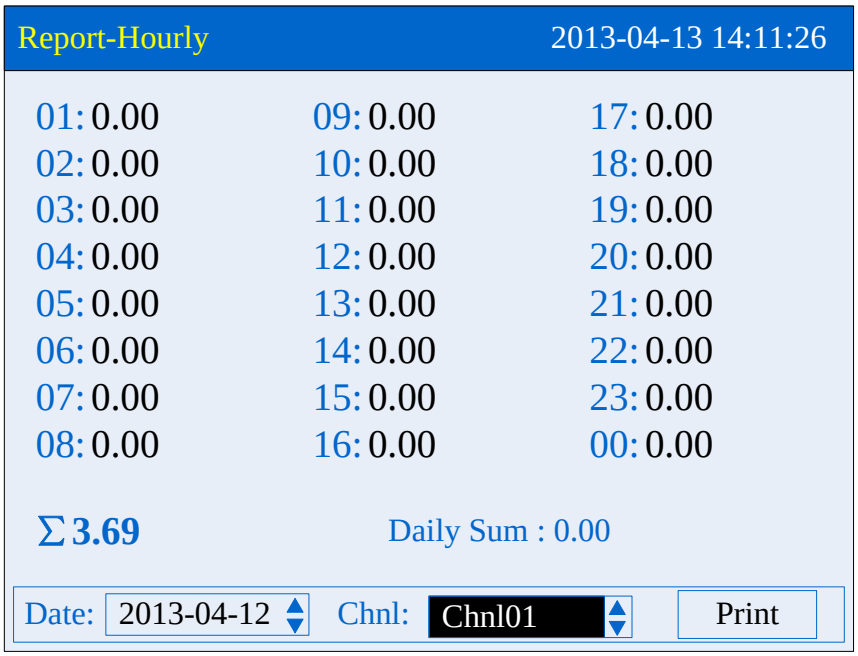
1. Channel tag. Displayed the alarm information.
2. Channel sequence number.
3. Alarm time. Displayed the alarm occur
4. Eliminate alarm time. Displayed the alarm
5. Alarm type. Displayed the alarm type.
6. This alarm time.
7. This eliminates alarm time.
8. This alarm type.
9. Relay state. Displayed 12 pieces of relay output state.

Relay type	Normal open	Normal close
Green	Open	Close
Red	Close	Open

4.8 Report

There are four types of cumulative report (Hourly, 8Hourly, 12Hourly, Daily, Monthly)

Report-Hourly

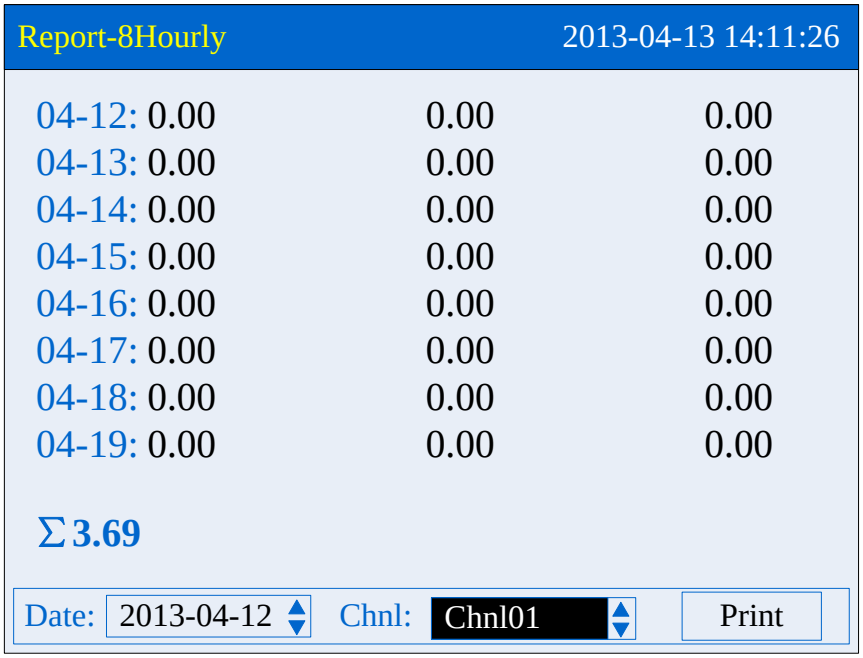


1. **Query**
   Query report by setting the date, uses [Left] or [Right] key to move the cursor, Press [Up] or [Down] key to configure the time .The report displays 24 hours' accumulation values on the screen.

2. **Channel selection**
   Move the cursor to the edit box of channel, Press [Up] or [Down] key to select the channel.

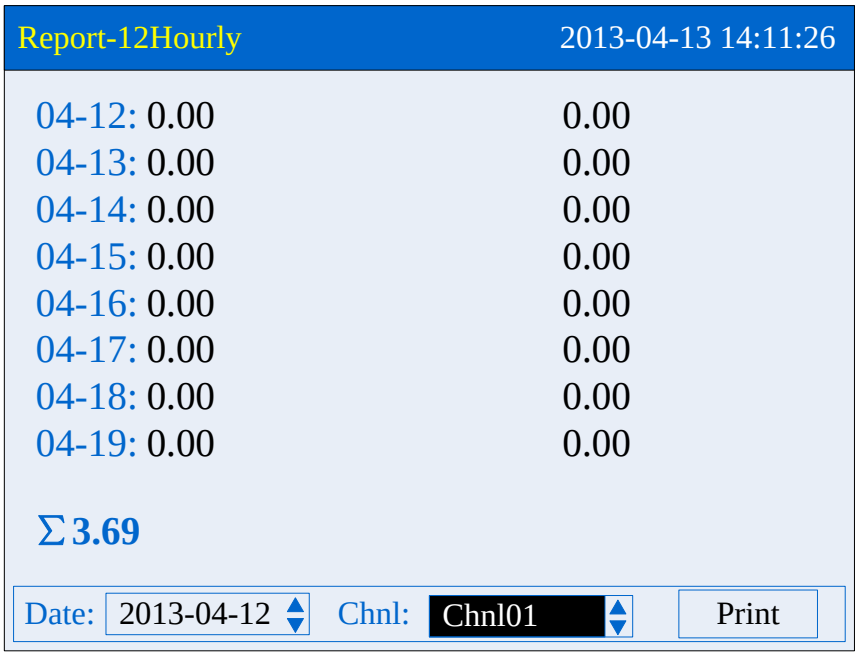
3. **Print**
   Move the cursor to the button named "Print", press [En] to print the report of current screen.

Report-8Hourly



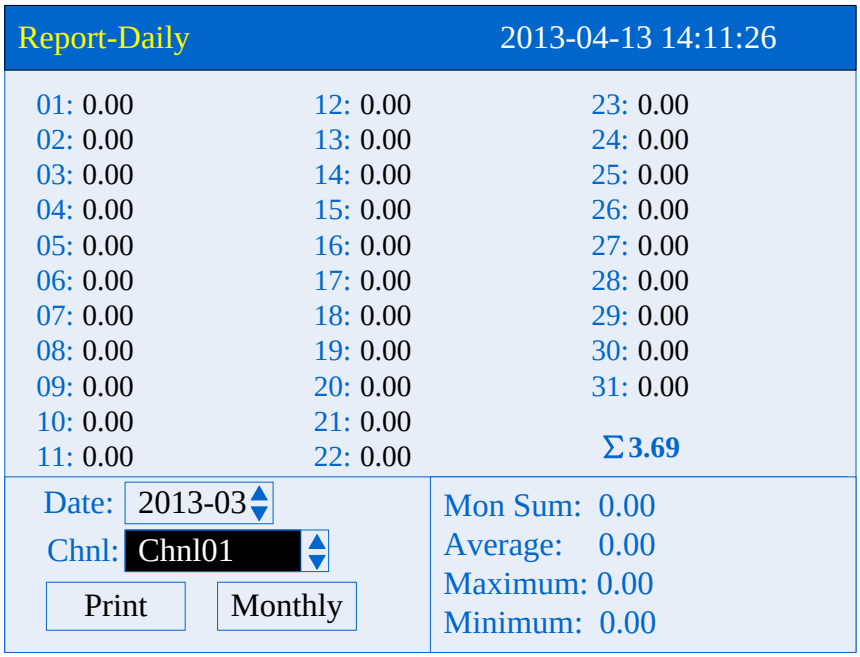
1. **Query**
   Query report by setting the date, uses [Left] or [Right] key to move the cursor, Press [Up] or [Down] key to configure the time. Display the data of 7 days since the date of the settlement, 3 cumulative values for each day.
2. **Channel selection**
   Move the cursor to the edit box of channel, Press [Up] or [Down] key to select the channel.
3. **Print**
   Move the cursor to the button named “Print”, press [En] to print the report of current screen.

Report-12Hourly



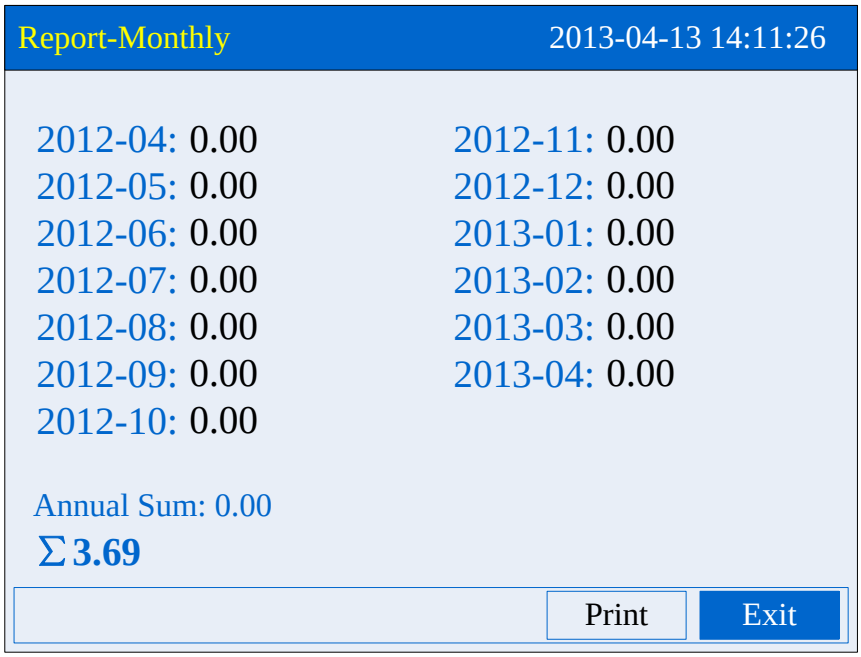
1. **Query**
   Query report by setting the date, uses [Left] or [Right] key to move the cursor, Press [Up] or [Down] key to configure the time. Display the data of 7 days since the date of the settlement, 2 cumulative values for each day.
2. **Channel selection**
   Move the cursor to the edit box of channel, Press [Up] or [Down] key to select the channel.
3. **Print**
   Move the cursor to the button named “Print”, press [En] to print the report of current screen.

Report-Daily



1. **Query**
   Query report by setting the date, uses [Left] or [Right] key to move the cursor, Press [Up] or [Down] key to configure the time. Display the data of 7 days since the date of the settlement, 2 cumulative values for each day.
2. **Channel selection**
   Move the cursor to the edit box of channel, Press [Up] or [Down] key to select the channel.
3. **Print**
   Move the cursor to the button named “Print”, press [En] to print the report of current screen.
4. **Report –Monthly**
   Move the cursor to the button named “Monthly”, press [En] to display monthly report.
5. **Stat.**
   Display the value of month sum, average, maximum and minimum

Report-Monthly



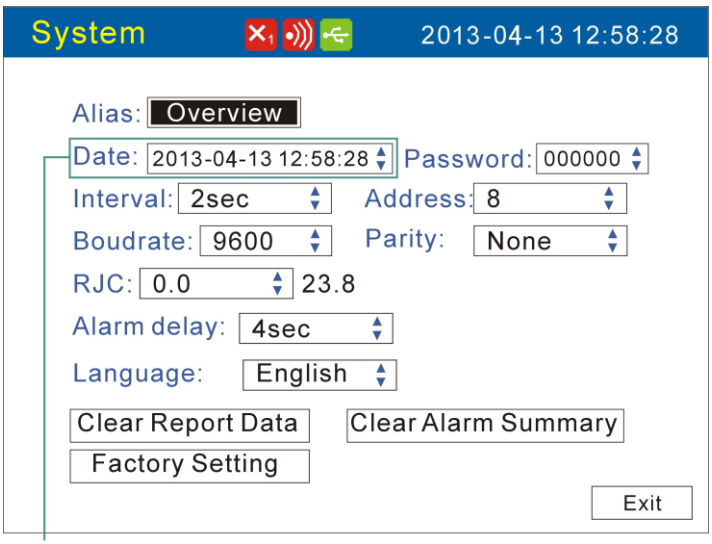
1. Display cumulative value of 13 months before current month
2. Move the cursor to the [Print] key, press the [En] key to print the current screen.
3. Move the cursor to the [Exit] key, press the [En] key back to the screen of Report-Daily.

Chapter 5 System Configurations

5.1 Setting the Date and Time

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [System] screen.



Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

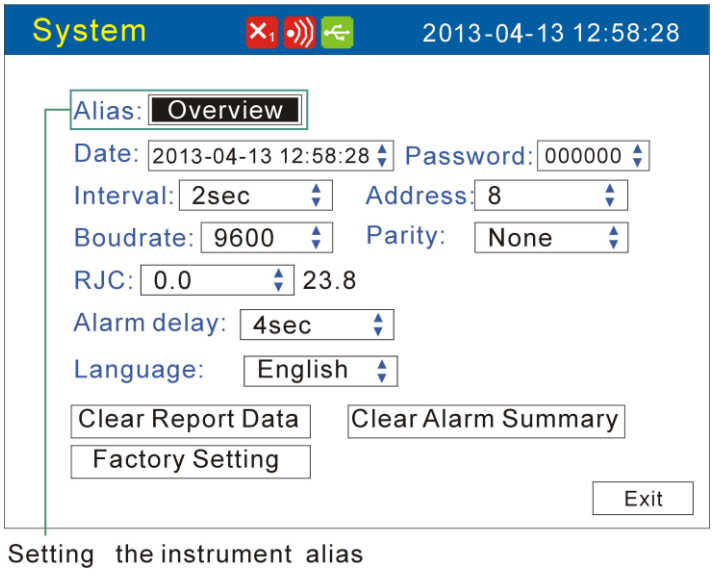
Caution

After setting system date / time, those historical data stored in instrument is invalid.
New and effective data begins after setting system date / time.
Before setting system date / time, please backup history data.

5.2 Setting the Alias

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [System] screen.



About the input method of editing parameter, see section『Common key operations』

Confirming operation

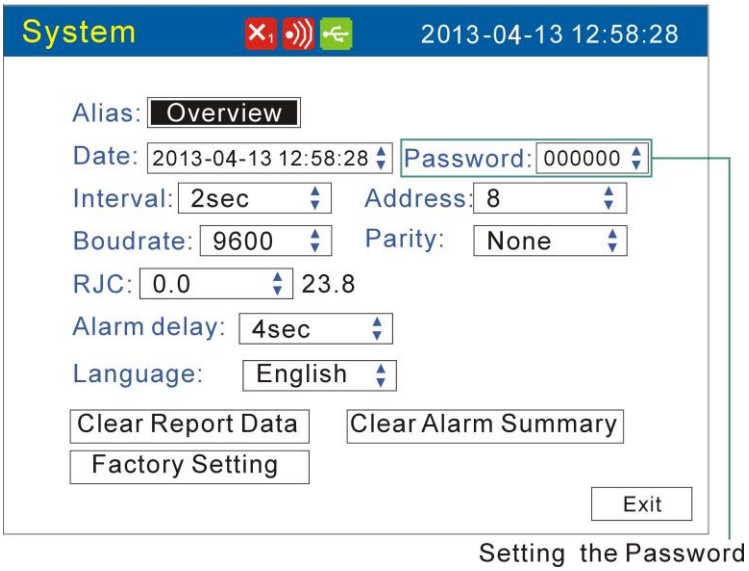
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

5.3 Setting the system password

System password is needed when modifies configuration parameters, and is used to prevent system parameters from being changed by accident.
It is made by 6 numbers.

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [System] screen.



About the input method of editing parameter, see section『Common key operations』

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

Note

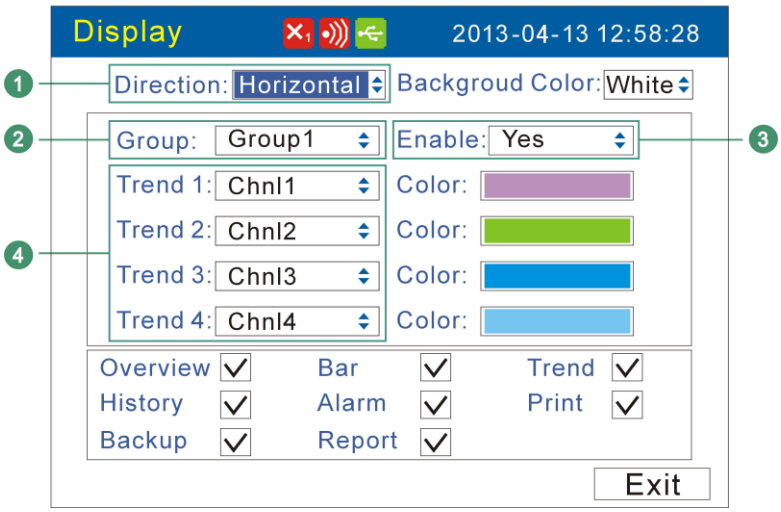
It is a unique password to modify configuration parameters. Once it is forgotten, it can not be modified those parameters.
The initial password is 000000, after purchasing instrument, it is better for users to amend it as soon as possible and preserve it properly.

5.4 Setting Trend Direction and Groups of the Trend

User can choose two directions of trends, horizontal and vertical. When the horizontal, the trend is from right to left; when vertical, it's from up to down.
User can set four trend groups and enable it to use. Each trend is composed of 1-4 trends, has 4 kind of different trend colors.

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Display] screen.



1. **Set the trend direction**
   Press arrow keys to choose the trend direction, horizontal or vertical. It's usable for Trend and History.
2. **Select the trend group**
   Press arrow keys to choose trend group.
3. **Enable the trend group to use or no**
   Move the cursor to [Enable], and use the arrow keys to set the trend group.
4. **Set the channel of current trend**
   User can input channels at discretion, there are four colors for the trend in right side.

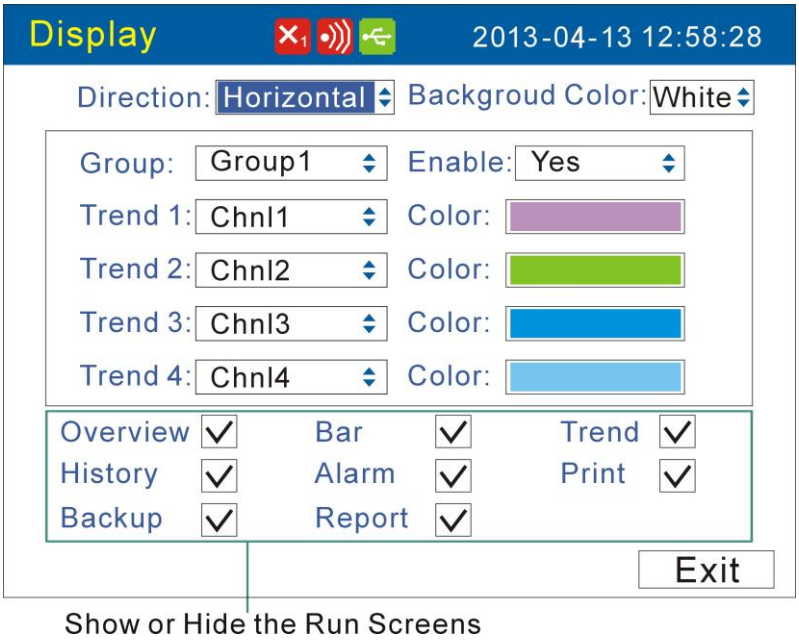
Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Display] screen.
Select [No] to cancel setting content, and exit [Display] screen.
Select [Cancel] to continue setting parameters in [Display] screen.

5.5 Show/Hide the Run Screens

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Display] screen.



Press arrow keys to show or hide the relevant screens.

Confirming operation

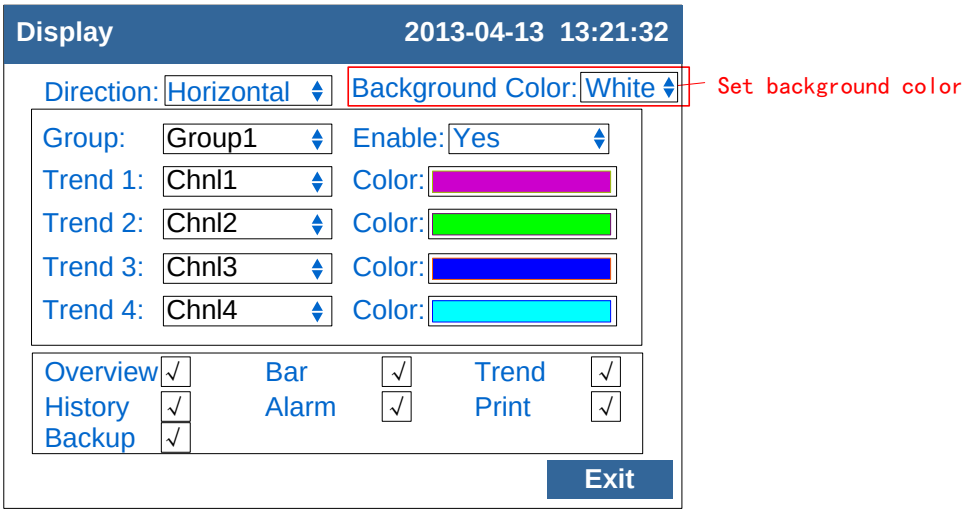
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Display] screen.
Select [No] to cancel setting content, and exit [Display] screen.
Select [Cancel] to continue setting parameters in [Display] screen.

5.6 Setting Background Color

User can choose background color for the screen of overview and bar .

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Display] screen.



Setting Background Color

Press arrow keys to choose white or black color for the background of overview and bar screens

Confirming operation

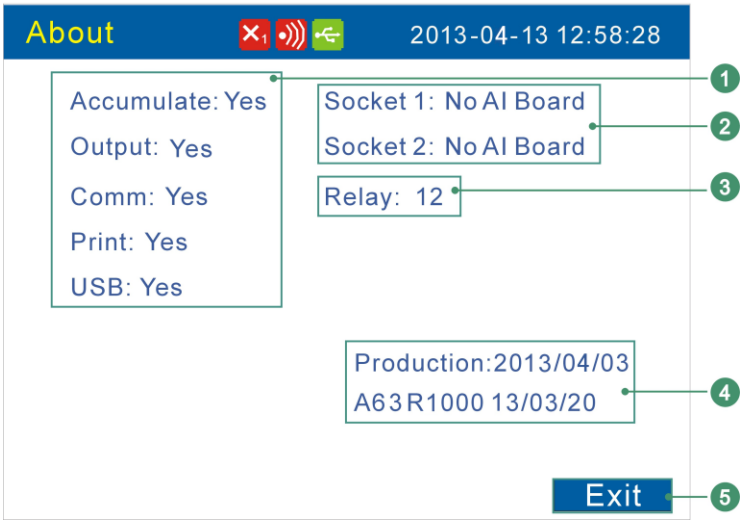
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Display] screen.
Select [No] to cancel setting content, and exit [Display] screen.
Select [Cancel] to continue setting parameters in [Display] screen.

5.7 System Information

Procedure

Press [Page] and [En] to enter configuration menu.
Use arrow keys and [En] to input the password, enter the [About] screen.

Explanation



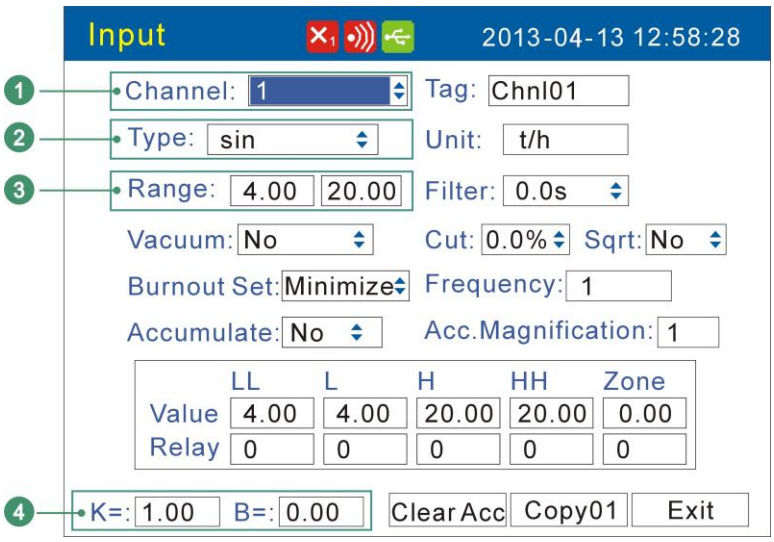
1. The Option Functions
2. The number and type of the hardware in-out channels.
3. The output loop of the relay
4. The Firmware issue date and version number
5. [Exit] soft key

Chapter 6 Input Channel Settings

6.1 Input type and Scaling Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



1. **Input channel**
   Select the channel to set the parameter, which is limited of the input board channel's number.
2. **Channel type**
   Set the current channel's input signal type.
3. **Channel range**
   Set the current channel's input signal measuring range.
4. **Adjust value**
   Set the correct value， Display data=Measure data ×K + B。

Note
The high and low value should not be the same. The low value is -9999 and high range is 19999.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

Specification

Measuring range

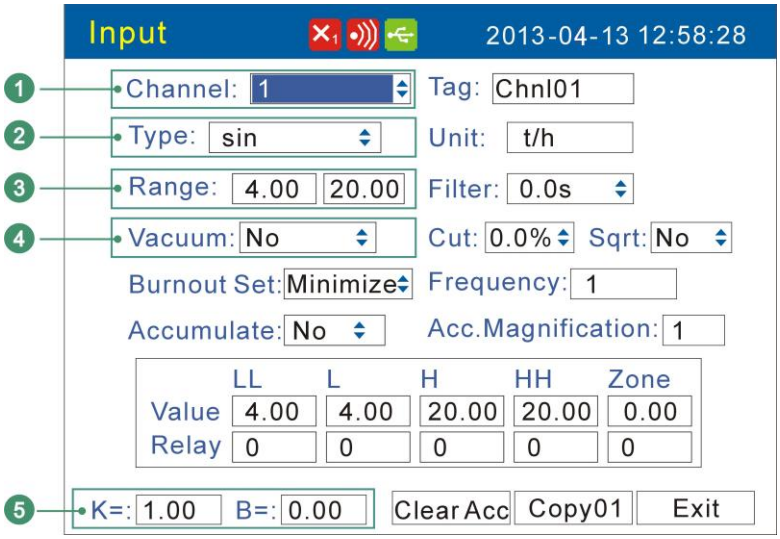
Type	Range	Measuring range
Current	4-20mA	4.00mA ～ 20.00mA
	0-10mA	0.00mA ～ 10.00mA
Volt	1-5V	1.000V ～ 5.000V
	0-5V	0.000V ～ 5.000V
	0-10V	0.000V ～ 10.000V
	20mV	0.00mV ～ 20.00mV
	100mV	0.00mV ～ 100.00mV
Resistance	350Ω	0.0Ω ～ 350.0Ω
Frequency	FR	0Hz ～ 10000Hz
RTD	PT100	-200.0℃ ～ 650.0℃
	Cu50	-50.0℃ ～ 140.0℃
	Cu53	-50.0℃ ～ 150.0℃
	BA1	-100℃ ～ 600℃
	BA2	-100℃ ～ 600℃
TC	S	-100℃ ～ 1600℃
	R	-50℃ ～ 1600℃
	B	500℃ ～ 1800℃
	K	-50℃ ～ 1300℃
	N	-200℃ ～ 1300℃
	E	-100℃ ～ 1000℃
	J	-100℃ ～ 1000℃
	T	-100℃ ～ 380℃
	WRE5-26	0℃ ～ 2310℃
	WRE3-25	0℃ ～ 2315℃
	F1	600℃ ～ 2000℃
	F2	600℃ ～ 2000℃
simulation	sin	Set the range freely.

See sections 6.5 and 6.6.

6.2 Input Vacuum Type and Scaling Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



1. **Input channel**
   Select the channel to set the parameter, which is limited of the input board channel's number.
2. **Channel type**
   Set the current channel's input signal type.
3. **Channel range**
   Set the current channel's input signal measuring range.
4. **Set vacuum type**
   There are two vacuum types, normal arithmetic and subsection arithmetic. User can choose it base on vacuum transmitter signal.
5. **Adjust value**
   When the measuring mode is vacuum measure, the adjust value will be invalidated.

Note

The high and low value should not be the same.
The low value is -9999 and high range is 19999. You can only change the index.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

6.3 Channel Tag and Unit Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.

1. **Channel tag**
   Press [En] to input channel tag, most ten English characters.
2. **Channel unit**
   Press [En] to input channel unit, most seven English characters.

Note
Channel unit and measure signal are Independence.

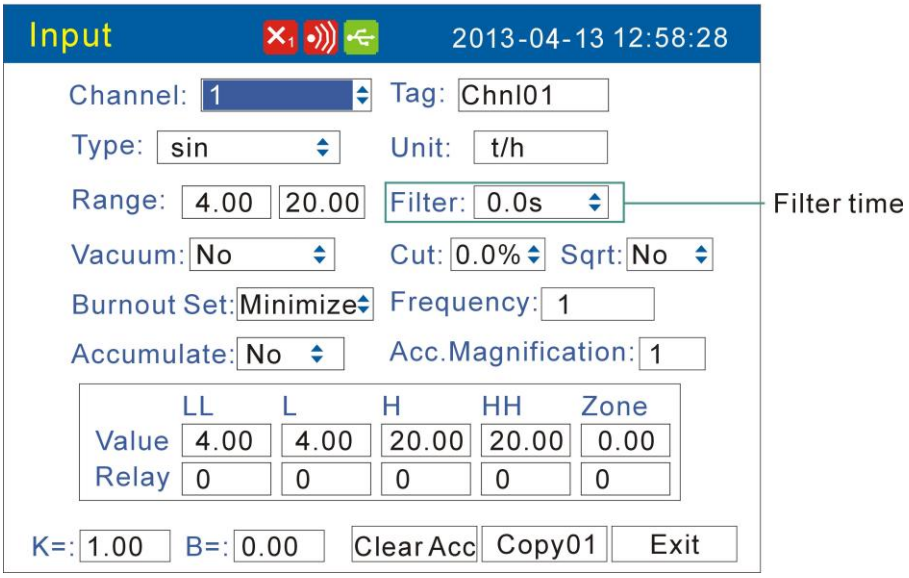
Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

6.4 Input Filter Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



Setting filter time constant
Press [Up] and [Down] to set the time, the range from 0.0S to 9.9S.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

Explanations

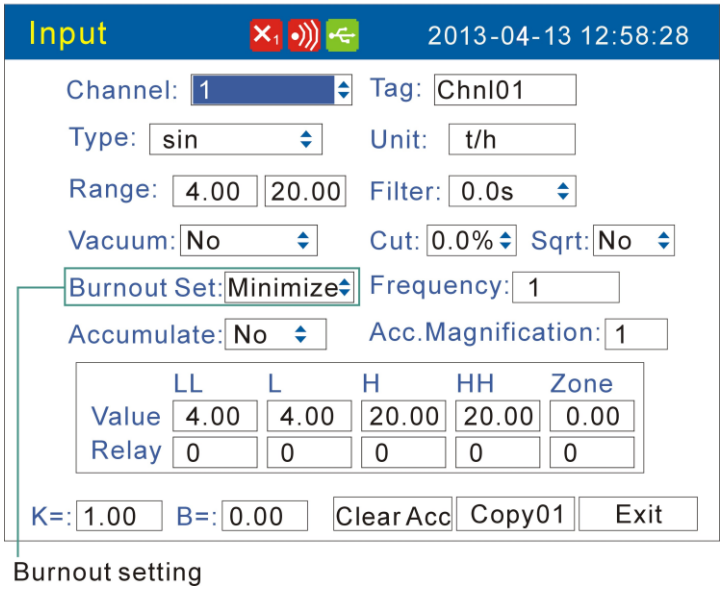
Filter setting method:

$$\text{Show value} = \frac{\text{Last value} \times \text{Input filter} + \text{Current value}}{\text{Input filter} + 1}$$

6.5 Burnout Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



Set with arrow keys.

Setting	Result
Least	Low limit
Max	High limit
Hold front value	Fix the finally right value before burnout
Error flag	#####

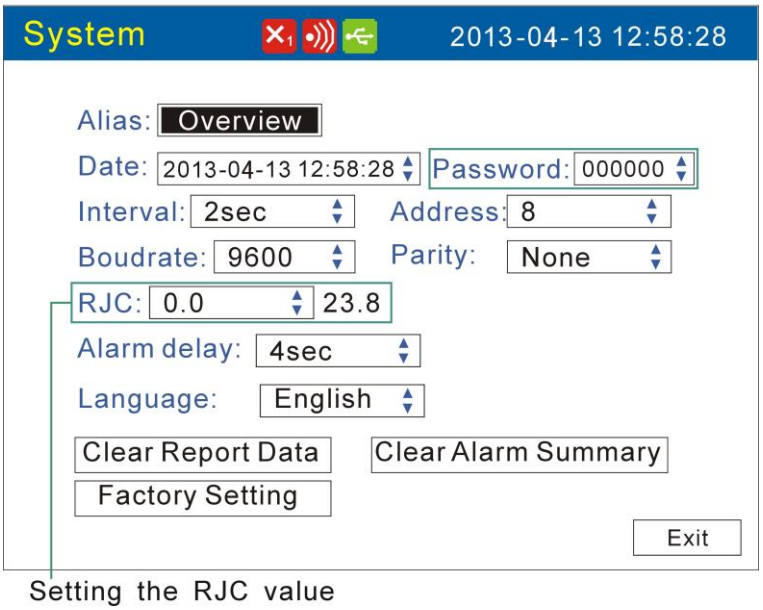
Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

6.6 Reference Junction Compensation

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [System] screen.



CJ compensational value

When there are some differences between the scene temperature and the cold temperature instrument measured, user can use the adjust function.
Compensation value= CJ measurement value + CJ adjusted value

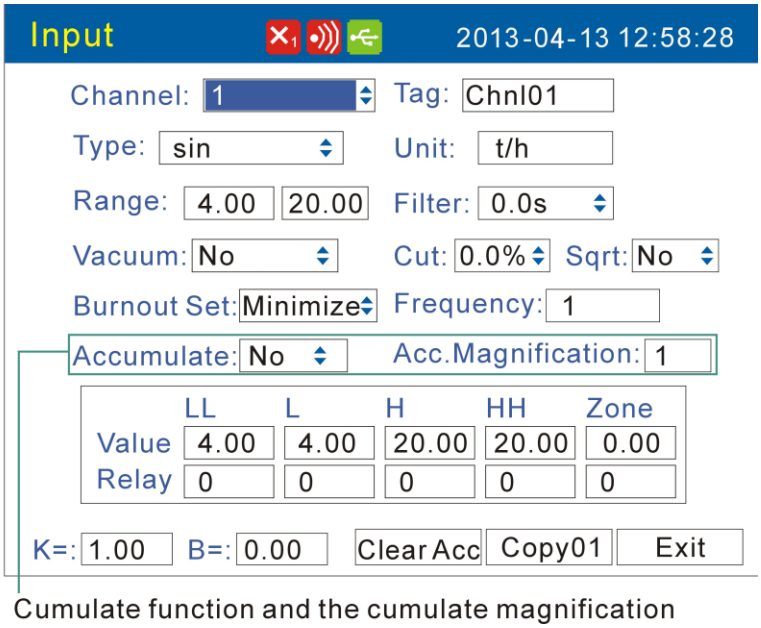
Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

6.7 Accumulation Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



Set the accumulate function and cumulate magnification

Move the cursor to [Accumulate]，use [Up] and [Down] to set the accumulate function.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

Explanation

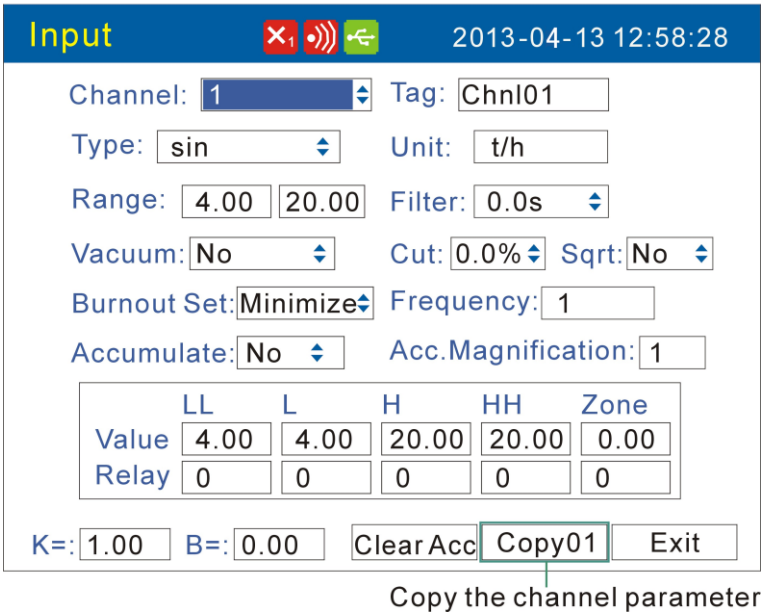
Accumulation function is that carries out time integral for current channel measurement value and arithmetic value.
The range of accumulation value is 0 ~ 9,999,999,999.9, one radix point.
It will clear voluntarily when accumulate value exceeding 9,999,999,999.9.
When enabled the accumulation function, the accumulation value can be displayed in the overview screen automatically.

6.8 Copying Channel Parameters

Use this function when channel A and channel B need to set the same parameter.

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



Copy the channel parameter

Move the cursor to [Copy01].
When used the [Up] and [Down] to copy source channel, it may display on the soft key.
Press [En] to confirm copying parameters.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

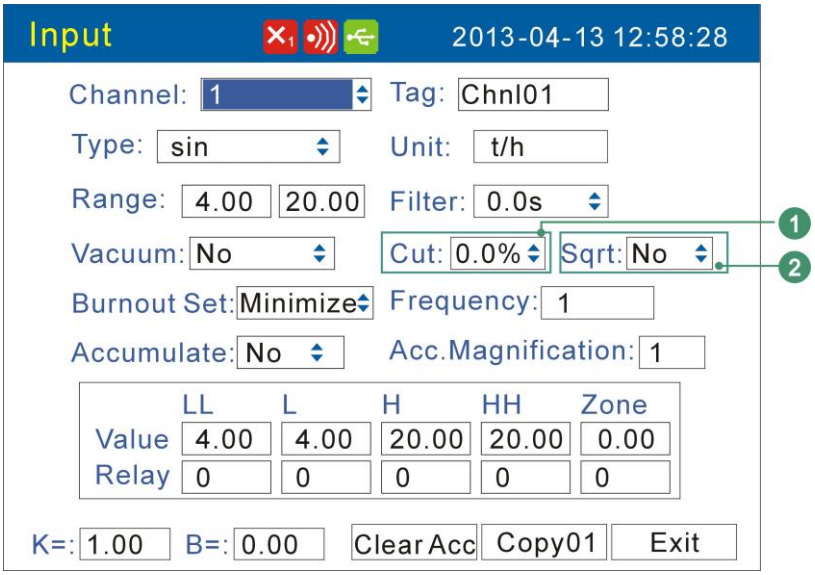
Explanation

The operations can copied the following parameter
Type / Unit / Range / Square / Vacuum /Filter / Cut / low low Alarm / low Alarm / high Alarm / high high Alarm /Zone /4 touch points/Adjust value.

6.9 Square Root Computation and Small Signal Cutting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



1. **Set the small signal cutting**
   Move the cursor to [Cut], modify the small signal cutting percent with [Up] and [Down] keys.
   If the signal is smaller than the signal cutting percent, it will be forced into lower limit of measurement range.

2. **Set the square root computation**
   Move the cursor to [Sqrt], enabled the square root computation with [Up] and [Down] keys.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

Explanation

Need to use to square root function in measurement differential pressure flow meter in pore plate, a few flow meter not bringing the square root function along per se , can use this function.
That the small signal cutting is to point to when rate of flow is lower than some threshold value, regard it being irrespective of flow turn to be able to ignore, flow shows for zero.

Chapter 7 Setting Alarms

7.1 Alarm Setting

Each channel can set four alarm values, high high alarm, high alarm, low alarm and low low alarm.

CAUTION

Set the measurement range before setting the alarm.
All of the alarm settings of a channel are canceled in the following cases:

- When the signal type is changed(Volt, Resistance)
- When the input range is changed
- When the setting compensation or square root operation

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.

1. **Select the alarm channel**
   The setting method is the same as the signal type and signal range
2. **Set the alarm threshold value**
   The threshold value must in the channel range.
3. **Set the alarm threshold value zone**
   Prevent the relay frequently action when the signal surged by the alarm threshold value.
4. **Set relay number**
   Output the relay with setting serial number when an alarm occurs.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Input] screen.
Select [No] to cancel setting content, and exit [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

Explanation

Alarm condition and Undo Alarm condition

Threshold type	Alarm condition	Undo Alarm condition
high-high threshold	Channel value > high-high threshold	Channel value< high-high threshold-zone.
high threshold	Channel value > high threshold	Channel value＜high threshold－zone.
low threshold	Channel value <low threshold	Channel value＞low threshold＋zone.
low-low threshold	Channel value <low-low threshold	Channel value＞low-low threshold＋zone.

Relay number setting

Alarm doesn't output to relay when the relay number setting is zero.

When sharing an alarm output relay among multiple alarms, each alarm will acted the relay activated.

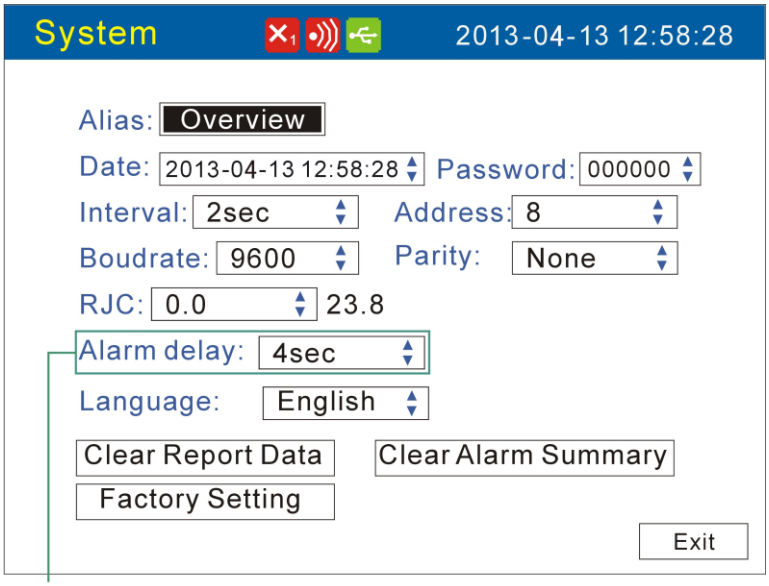
Normally closed relay（Option）

The Initialization is normally opened relay, if you need normally closed relay, please contact us.

7.2 Setting the Relay Delay Period

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [System] screen.



Setting the Relay Delay Period

About the input method of editing parameter, see section『Common key operations』

The Relay Delay Period

For preventing the relay mistake action, in appearance system group state, relay time lapse can set 0-10 seconds to delay trigger under the system configuration.
Think that the queen who gives an alarm coming into being continues setting up second of inner signal being in the state giving an alarm without exception or continues setting up second of inner signal without exception in eliminating newspaper state, relay only meeting action.
The relay will action when the continue setting second signal under alarm state or undo alarm state.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

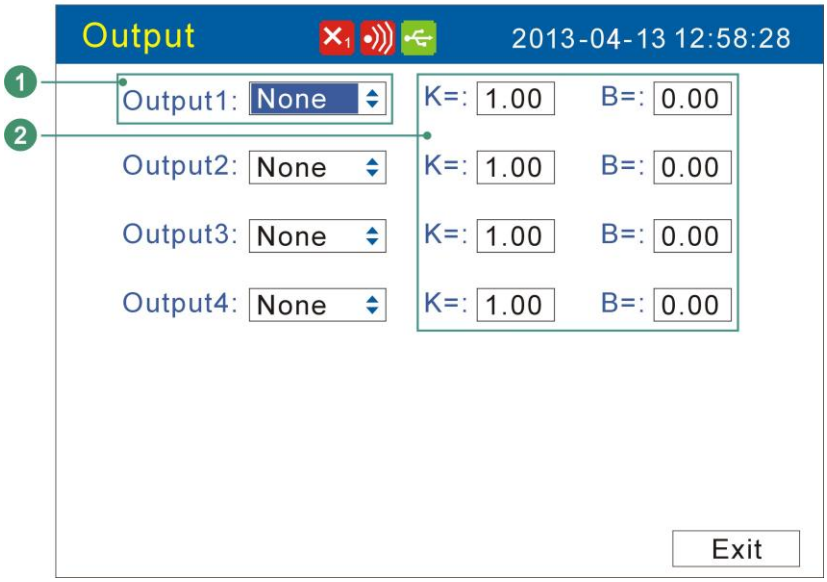
Chapter 8 Setting Analog Outputs

8.1 Analog Outputs Setting

The instrument provides 4-20mA analog output.

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Output] screen.



1. **Set the output source channel**
   Set the source of this channel output value.
2. **Output the adjust value**
   Output value = Current value ×K + B。

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Output] screen.
Select [No] to cancel setting content, and exit [Output] screen.
Select [Cancel] to continue setting parameters in [Output] screen.

Explanation

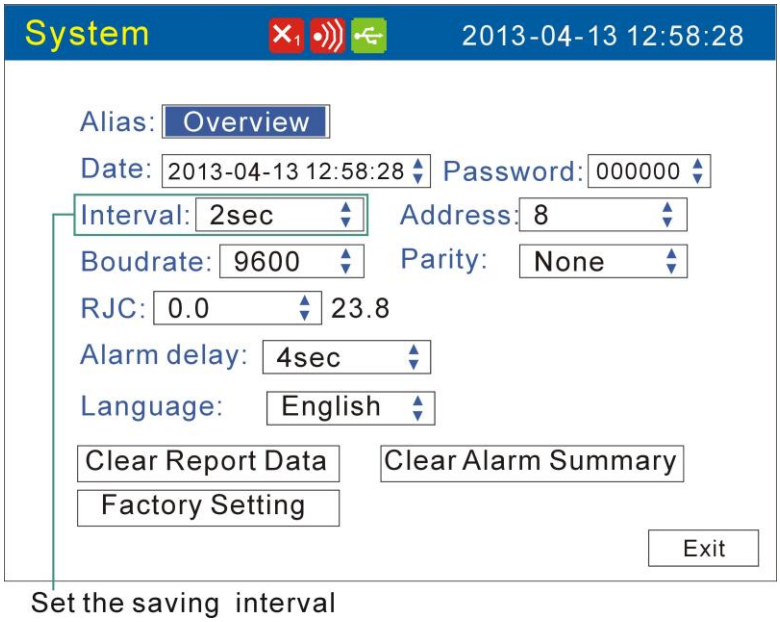
The analog output only supports 4-20mA
According to the channel measurement range, converts the source channel value to percentage, then transforms to 4-20mA analog output.
When there is no output source channel , the analog output will fix to4mA。

Chapter 9 Data Saving and Saving to External Storage Medium

9.1 Setting the Saving Interval of Internal Memory

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [System] screen.



Set the saving interval

User can choose 1s/2s/5s/10s/15s/30s/1min/2min/4min.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

Explanation

The sample period is 1 second, so the smallest records interval is 1 second.
Increasing the interval can prolong the time length of storage data.

Note

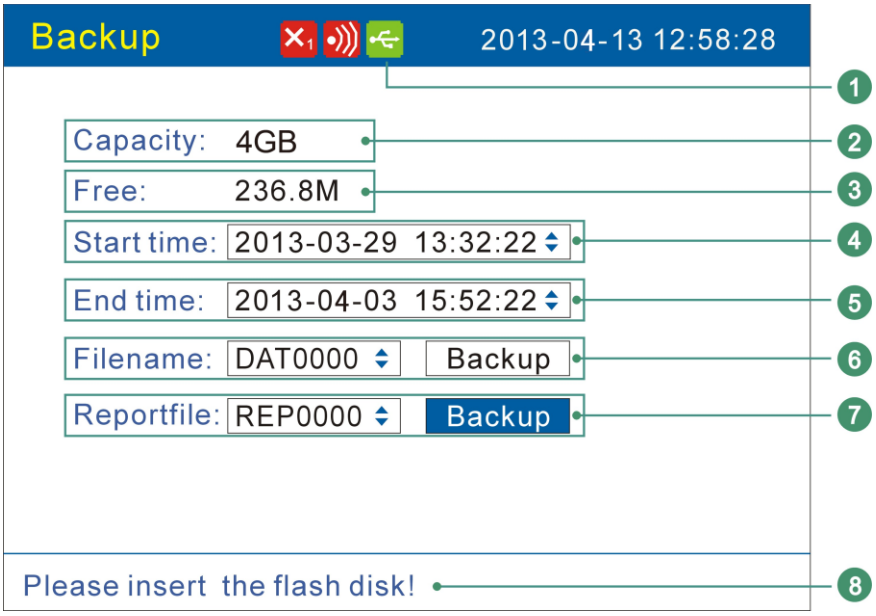
The interior saving historical data will be invalidation if you modify the saving interval, therefore, please backup the historical data before you modify it, prevents the loss.

The relation of the saving interval and time length

Interval	Time length
1 second	72 hour/channel
2 second	6 day/ channel
5 second	15 day/ channel
10 second	30 day/ channel
15 second	45 day/ channel
30 second	90 day/ channel
1 minute	180 day/ channel
2 minute	360 day/ channel
4 minute	720 day/ channel

9.2 Saving to External Storage Medium

Procedure



1. U Disk insertion symbol
2. U Disk aggregate capacity
3. U Disk surplus capacity
4. The internal data starting time
5. The internal data ending time
6. Set the data filename, and backup this file.
7. Set the Report file, and backup this file.
8. The status bar.

Explanation

The meanings of the status bar information

Item	Contents
Please insert the flash disk!	Instrument has detected the U disk on the USB interface.
Find the hardware...	Measure the U Disk information and space available.
Initialization succeeds!	Be good preparation for data backup.
Backup the file（Blue schedule）	Backup now, please wait for.
Backup is finished!	Backup is finished; you can pullout the U Disk.
File of the same name exists!	The same name document has existed, changes the name of this file and back up again.
Backup fails!	Format the disk, and backup again.

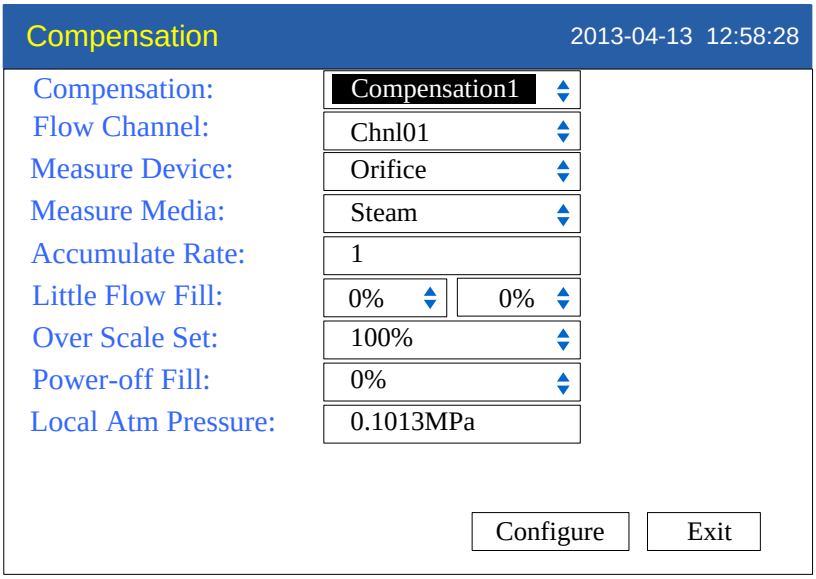
Chapter 10 Setting Temperature pressure Parameters

10.1 Set Temperature And Pressure Compensation Model And The Flow Channel Parameters

This section describes how to set the parameters of temperature and pressurecompensation model, flow channel, measuring devices and measuring dielectric, etc.

Operation

Press the [page] and [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [compensation].



1. **Compensation**
   Select the compensation channel, a total number of four channels. Select with [Up and Down] key.
2. **Flow channel**
   set the compensation flow channel. Select with [Up and Down] key.
3. **Measuring device**
   set the compensation medium measurement device, which has a plate, vortex (frequency), vortex (mA). Select with [Up and Down] key .
4. **Measuring medium**
   set the measurement medium, which has steam, water and general gases. Select with [Up and Down] key.
5. **Cumulative rate**
   set accumulation rate values, according to [the instantaneous value × magnification]. Press [En] key to modify the settings, [up and down] key to adjust.
6. **Small flow fill**
   the first setting value is the percentage of small flow limit; the second setting value

is the percentage of compensation. The Percentage is all flow range percentage. To adjust settings with [Up and Down] keys.
When the instantaneous flow rate is less than the first set value, the flow accumulation value according to make up the second set.

7. **Over-range setting**
   when instantaneous flow exceeds maximum range, and then it will lead to top destruction, according to [flow range × set value] accumulation. To adjust settings with [Up and Down] keys
8. **Power-down fill**
   Cumulative value and the statements during a power outage is according to [flow range × set value] calculated compensation. To adjust settings with [Up and Down] keys.
9. **Parameter setting**
   Press [En] key to enter the temperature and pressure compensation parameter setting screen.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [compensation] screen.
Select [No] to cancel setting content, and exit [compensation] screen.
Select [Cancel] to continue setting parameters in [compensation] screen.

Explain

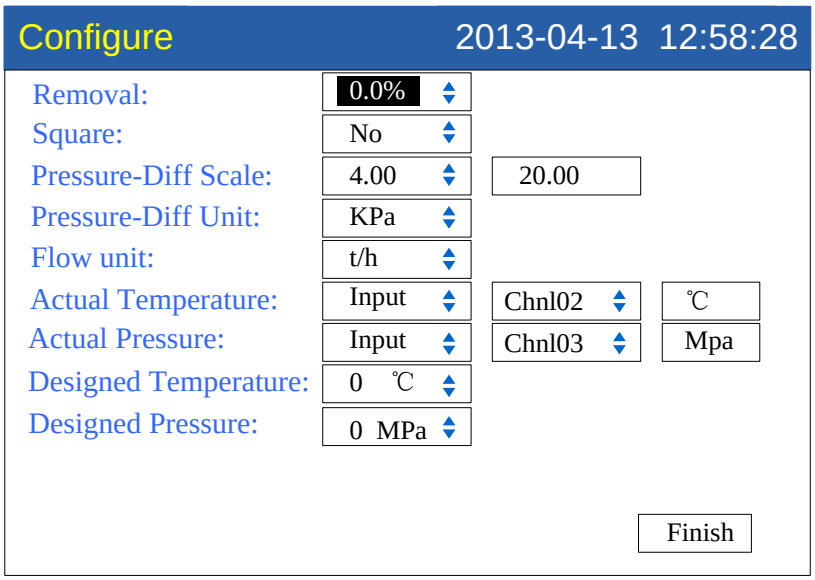
During flow accumulation, it should the first cut the small signal, and then calculated the flow after compensation according to temperature and pressure compensation formula. Then have calculation on small flow compensation, over range compensation, accumulation, and finally get the last flow to accumulate.

10.2 Orifice + Steam Parameter Setting

This section describes measuring device (orifice) and measuring medium (steam) parameters setting.

Operation

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be the limit input. To adjust settings with [Up and Down] keys
2. **Square root**
   To have square root calculation on the percentage of the differential pressure signal. To adjust settings with [Up and Down] keys
3. **Differential pressure range**
   To acquire differential signal to display range. Press [En] key to modify the settings. To adjust settings with [Up and Down] keys
4. **Differential pressure units**
   Differential pressure signal units is involved in operations. It is fixed at KPa.
5. **Flow units**
   Flow units is involved in operations, the default is t / h (or t / h, kg / h). Press [up and down] key to select.
6. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and

down] key to select.
[Set]: Set the constant value for temperature. Press [En] button to change settings, press [up and down] key to adjust.

7. Pressure condition

Input type: [enter], [set] (two options).
[Input]: Select the signal channel input for the pressure value, press [up and down] key to select.
[Set]: Set the constant value for pressure. Press [En] button to change settings, press [up and down] key to adjust.

8. Set temperature

Set temperature value. Press [En] button to change settings, press [up and down] key to adjust.

9. Design pressure

Set pressure value. Press [En] button to change settings, press [up and down] key to adjust.

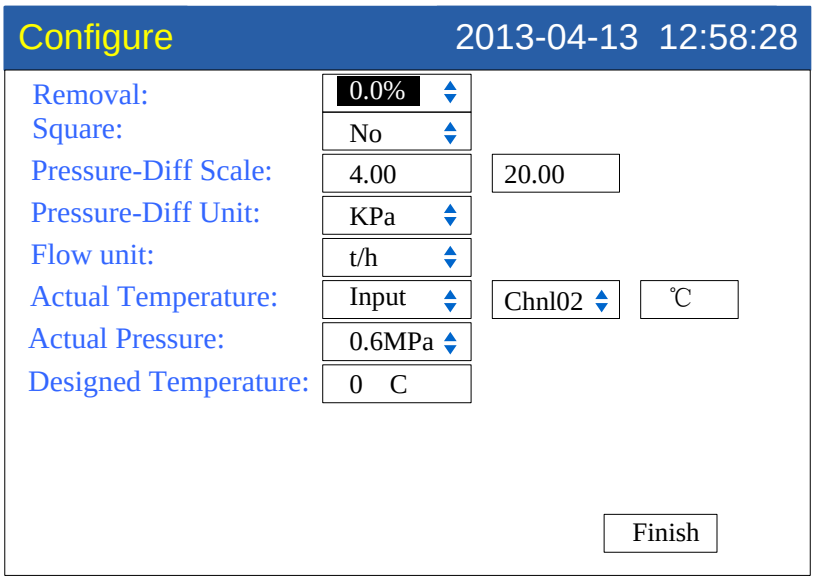
10. Cursor to the [Finish] button, press the [En] button to return.

10.3 Orifice + Water Parameter Setting

This section describes measuring device (orifice) and measuring medium (water) parameters setting.

Operating

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be the limit input. To adjust settings with [Up and Down] keys
2. **Square root**
   To have square root calculation on the percentage of the differential pressure signal. To adjust settings with [Up and Down] keys
3. **Differential pressure range**
   To acquire differential signal to display range. Press [En] key to modify the settings. To adjust settings with [Up and Down] keys
4. **Differential pressure units**
   Differential pressure signal units is involved in operations. It is fixed at KPa.
5. **Flow units**
   Flow units is involved in operations, the default is t / h (or t / h, kg / h). Press [up and down] key to select.
6. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and

down] key to select.
[Set]: Set the constant value for temperature. Press [En] button to change settings, press [up and down] key to adjust.

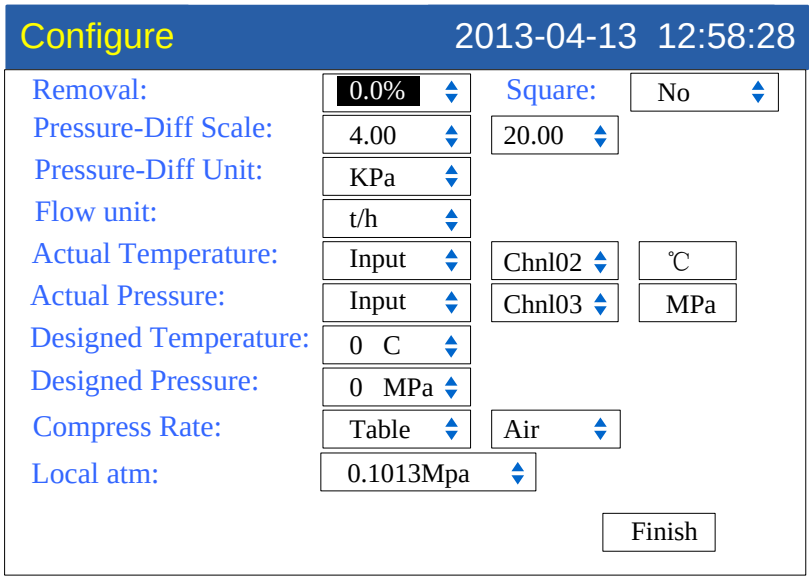
7. **Pressure condition**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the pressure value, press [up and down] key to select.
   [Set]: Set the constant value for pressure. Press [En] button to change settings, press [up and down] key to adjust.
8. **Set temperature**
   Set temperature value. Press [En] button to change settings, press [up and down] key to adjust.
9. **Cursor to the [Finish] button, press the [En] button to return.**

10.4 Orifice + General Gas Parameter Setting

This section describes measuring device (orifice) and measuring medium (general gas) parameters setting.

Operating

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be the limit input. To adjust settings with [Up and Down] keys
2. **Square root**
   To have square root calculation on the percentage of the differential pressure signal. To adjust settings with [Up and Down] keys
3. **Differential pressure range**
   To acquire differential signal to display range. Press [En] key to modify the settings. To adjust settings with [Up and Down] keys
4. **Differential pressure units**
   Differential pressure signal units is involved in operations. It is fixed at KPa.
5. **Flow units**
   Flow units is involved in operations. It is fixed at m3/h.
6. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.
   [Set]: Set the constant value for temperature. Press [En] button to change settings,

press [up and down] key to adjust.

7. Pressure condition

Input type: [enter], [set] (two options).

[Input]: Select the signal channel input for the pressure value, press [up and down] key to select.

[Set]: Set the constant value for pressure. Press [En] button to change settings, press [up and down] key to adjust.

8. Set temperature

Set temperature value. Press [En] button to change settings, press [up and down] key to adjust.

9. Designed pressure

Set design pressure value. Press [En] button to change settings, press [up and down] key to adjust.

10. Compressibility coefficient

General gas‘s compressibility coefficient. There are [set], [check] two options.

[Settings]: free to set the compression factor. Press [En] button to change settings, press [up and down] key to adjust.

[Check]: There are three kinds of gas models: air, nitrogen, oxygen, press [up and down] key to select.

11. The local atmospheric pressure

Atmospheric pressure where the user locates. Press [En] button to change settings, press [up and down] key to adjust.

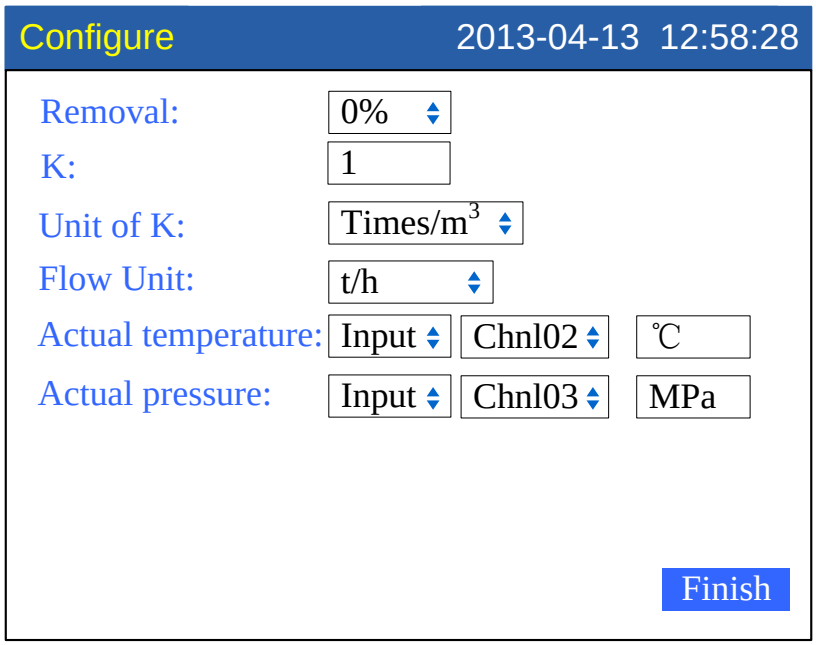
12. Cursor to the [Finish] button, press the [En] button to return.

10.5 Vortex (Frequency) + Steam Parameter Setting

This section describes measuring device (vortex) and measuring medium (steam) parameters setting.

Operating

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   the setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be the limit input. To adjust settings with [Up and Down] keys

2. **K Vortex average K factor setting.**
   Press [En] key to modify the settings. . To adjust settings with [Up and Down] keys.

3. **K factor unit**
   K factor unit is involved in operation.
   The default is time / m3 (optional times / m3, plays / L). To adjust settings with [Up and Down] keys

4. **Flow units**
   Traffic units involved in operations, the default is t / h (optional t / h, kg / h), press [up and down] key to select.

5. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.

[Set]: Set the constant value for temperature. Press [En] button to change settings, press [up and down] key to adjust.

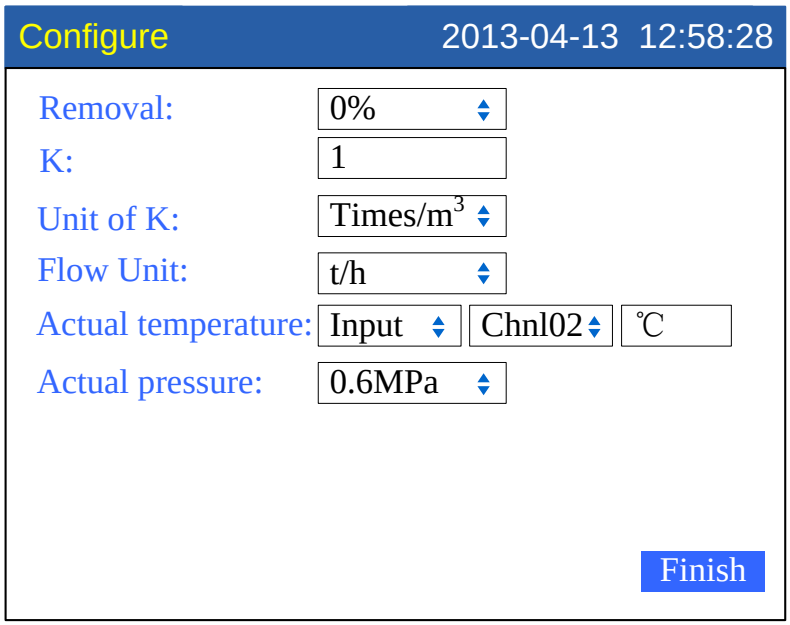
6. **Pressure condition**
   Choose [0.6MPa] or [1.6Mpa.Press [up and down] key to select.
7. **Cursor to the [Finish] button, press the [En] button to return.**

10.6 Vortex (Frequency) + Water Parameter Setting

This section describes the measuring device (vortex (frequency) and measured medium (water) parameter settings.

Operation

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



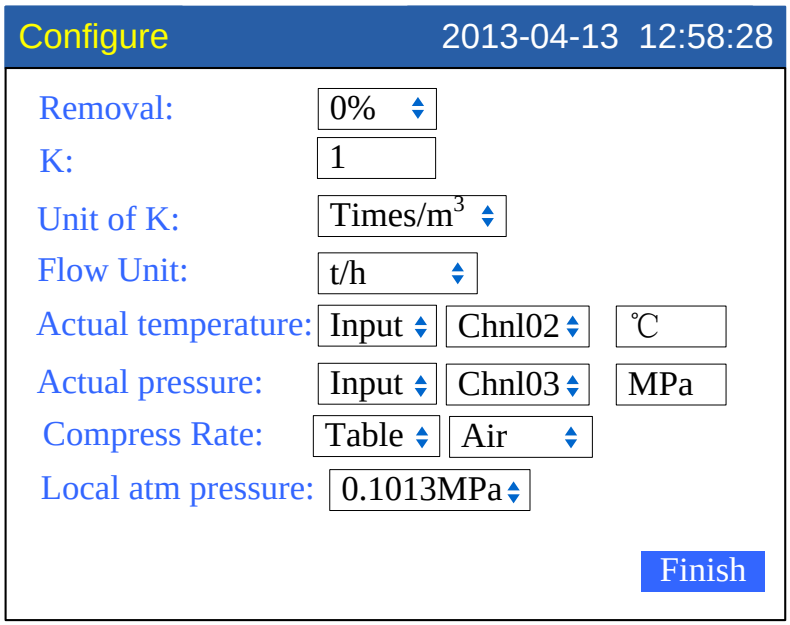
1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be the limit input. To adjust settings with [Up and Down] keys
2. **K Vortex average K factor setting.**
   Press [En] key to modify the settings. . To adjust settings with [Up and Down] keys
3. **K factor unit**
   K factor unit is involved in operation.
   The default is time / m3 (optional times / m3, plays / L). To adjust settings with [Up and Down] keys
4. **Flow units**
   Traffic units involved in operations, the default is t / h (optional t / h, kg / h), press [up and down] key to select.
5. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.

10.7 Vortex (Frequency) + General Gas Parameter Setting

This section describes the measuring device (vortex (frequency) and measured medium (general gas) parameter settings.

Operation

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be 0. To adjust settings with [Up and Down] keys.
2. **K Vortex average K factor setting.**
   Press [En] key to modify the settings. . To adjust settings with [Up and Down] keys.
3. **K factor unit**
   K factor unit is involved in operation.
   The default is time / m3 (optional times / m3, plays / L). To adjust settings with [Up and Down] keys.
4. **Flow units**
   Flow units is involved in operations. It is fixed at m3/h.
5. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.
   [Set]: Set the constant value for temperature. Press [En] button to change settings, press [up and down] key to adjust.

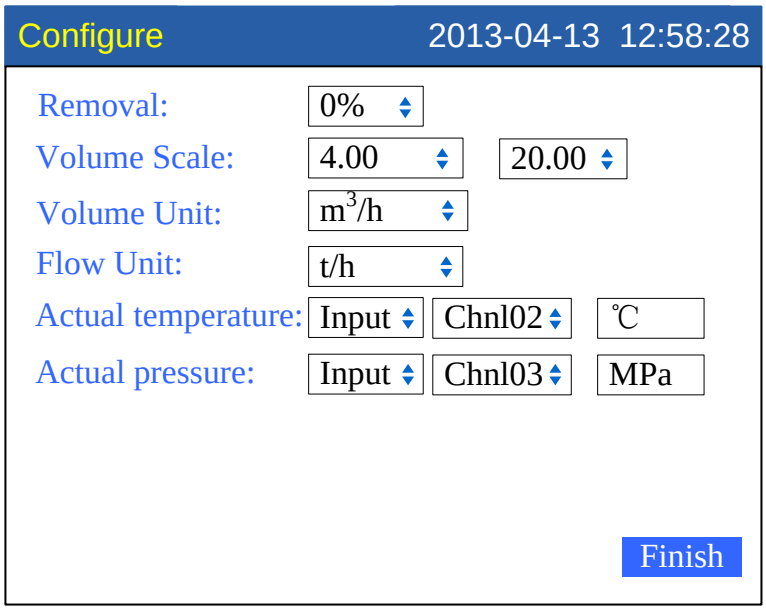
6. **Pressure condition**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the pressure value, press [up and down] key to select.
   [Set]: Set the constant value for pressure. Press [En] button to change settings, press [up and down] key to adjust.
7. **Compressibility coefficient**
   General gas‘s compressibility coefficient. There are [set], [check] two options.
   [Settings]: free to set the compression factor. Press [En] button to change settings, press [up and down] key to adjust.
   [Check]: There are three kinds of gas models: air, nitrogen, oxygen, and press [up and down] key to select.
8. **The local atmospheric pressure**
   Atmospheric pressure where the user locates. Press [En] button to change settings, press [up and down] key to adjust.
9. **Cursor to the [Finish] button, press the [En] button to return.**

10.8 Vortex (mA) + Steam Parameter Setting

This section describes the measuring device (vortex (ma) and measured medium (steam) parameter settings.

Operation

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be input limit. To adjust settings with [Up and Down] keys
2. **Volume Range**
   Collect display range of volume signal, and press [En key to modify the settings, and press [up and down] key to adjust.
3. **Volume unit**
   Volume unit is involved in operations, fixed at m3 / h.
4. **Flow units**
   Flow units is involved in operations, the default is t / h (optional t / h, kg / h), press [up and down] key to select.
5. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.
   [Set]: Set the constant value for temperature. Press [En] button to change settings,

press [up and down] key to adjust.

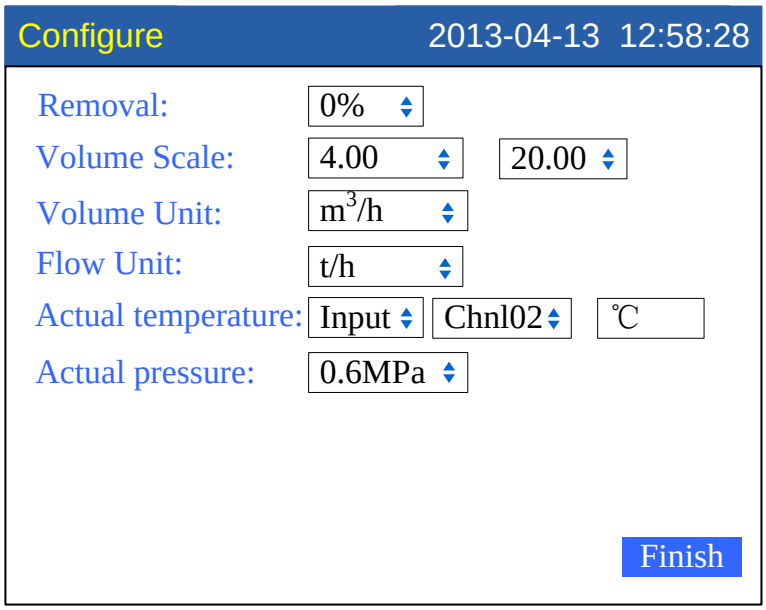
6. **Pressure condition**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the pressure value, press [up and down] key to select.
   [Set]: Set the constant value for pressure. Press [En] button to change settings, press [up and down] key to adjust.
7. **Cursor to the [Finish] button, press the [En] button to return.**

10.9 Vortex (mA) + Water Parameter Setting

This section describes the measuring device (vortex (ma) and measured medium (water) parameter settings.

Operation

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be input limit. To adjust settings with [Up and Down] keys.
2. **Volume Range**
   Collect display range of volume signal, and press [En key to modify the settings, and press [up and down] key to adjust.
3. **Volume unit**
   Volume unit is involved in operations, fixed at m3 / h.
4. **Flow units**
   Flow units is involved in operations, the default is t / h (optional t / h, kg / h), press [up and down] key to select.
5. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.
   [Set]: Set the constant value for temperature. Press [En] button to change settings,

press [up and down] key to adjust.

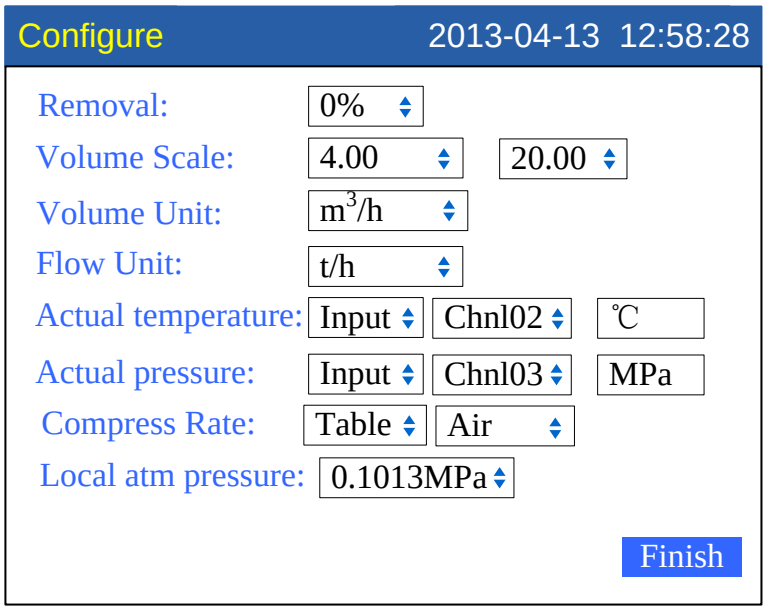
6. **Pressure condition**
   Input type: [enter], [set] (two options).
   Choose [0.6MPa] or [1.6Mpa], and press [up and down] key to adjust.
7. **Cursor to the [Finish] button, press the [En] button to return.**

10.10 Vortex (mA) + General Gas Parameter Setting

This section describes the measuring device (vortex (ma) and measured medium (general gas) parameter settings.

Operation

Press the [page] + [En], enter the configuration menu.
Use the [arrow keys] and [En] button, enter the password, and then select to enter the [flow compensation].
Move the cursor to the [Parameter setting] button, press the [En] key to enter the parameter setting screen.



1. **Resection of the small signal**
   The setting range is 0.0-9.9%, expressed by a percentage. If Input differential signal is less than set value range, it will be 0. To adjust settings with [Up and Down] keys.
2. **Volume Range**
   Collect display range of volume signal, and press [En key to modify the settings, and press [up and down] key to adjust.
3. **Volume unit**
   Volume unit is involved in operations, fixed at m3 / h.
4. **Flow units**
   Flow units are involved in operations. It is fixed at m3/h.
5. **Temperature conditions**
   Input type: [enter], [set] (two options).
   [Input]: Select the signal channel input for the temperature value, press [up and down] key to select.
   [Set]: Set the constant value for temperature. Press [En] button to change settings, press [up and down] key to adjust.
6. **Pressure condition**

Input type: [enter], [set] (two options).
[Input]: Select the signal channel input for the pressure value, press [up and down] key to select.
[Set]: Set the constant value for pressure. Press [En] button to change settings, press [up and down] key to adjust.

7. Compressibility coefficient

General gas's compressibility coefficient. There are [set], [check] two options.
[Settings]: free to set the compression factor. Press [En] button to change settings, press [up and down] key to adjust.
[Check]: There are three kinds of gas models: air, nitrogen, oxygen, and press [up and down] key to select.

8. The local atmospheric pressure

Atmospheric pressure where the user locates. Press [En] button to change settings, press [up and down] key to adjust.

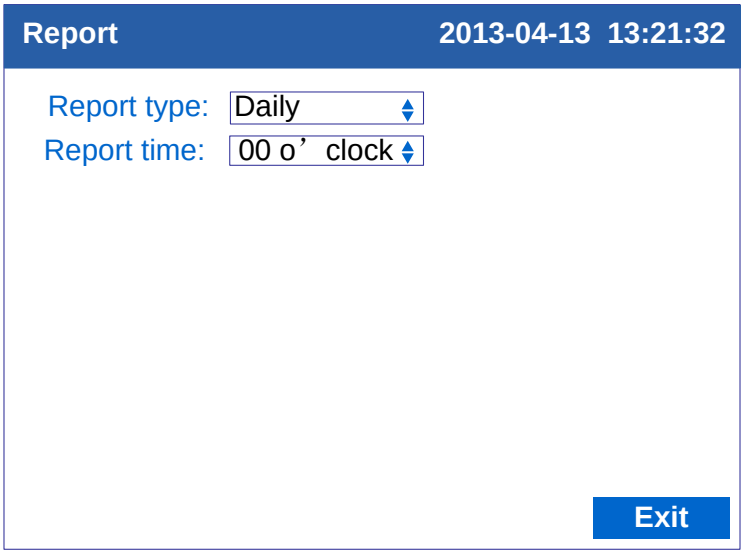
9. Cursor to the [Finish] button, press the [En] button to return.

Chapter 11 Setting Report

11.1 Setting specifications of report

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Report] screen.



1. **Report type**
   Select report type for display and saving, there are four options: Hourly, 8Hourly, 12Hourly and Daily (you can get into the Report-Monthly screen while at the screen of Report-Daily)

2. **Report time**
   Setting report time. Using [Up] or [Down] key to Configure the report time from 00 o’clock to 07 o’clock.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Report] screen.
Select [No] to cancel setting content, and exit [Report] screen.
Select [Cancel] to continue setting parameters in [Report] screen.

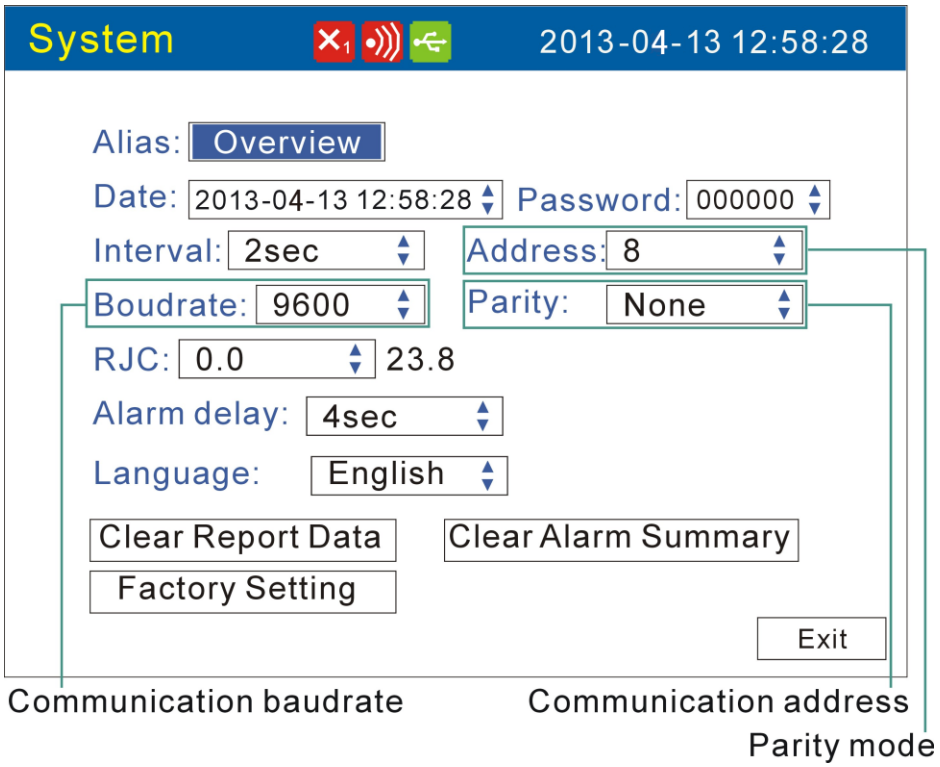
Warning
Do not change the report type at will; the change will cause the internal data to be chaotic.

Chapter 12 Communication Function

12.1 Communication Using RS232C (Option)

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [system] screen.



Item	Content
Communication address	0 – 255
Communication baud rate	1200/2400/4800/9600/19200/38400/57600
Communication parity mode	None/Odd/Even

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

Explanation

1. Connects communication wiring.
2. Setting the instrument's communication address, baud rate, parity.
3. The setting of the PC's communication address, baud rate, and parity are the same of the instruments.
4. Use it.

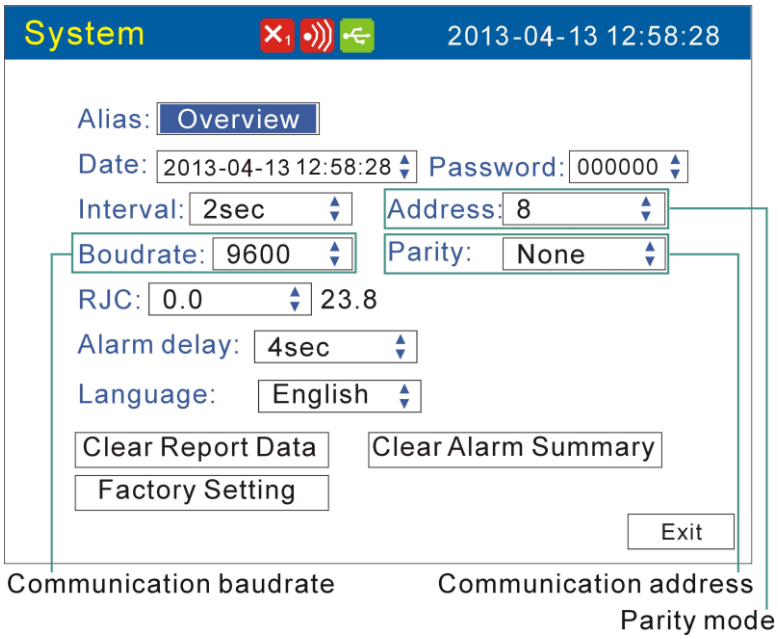
The port of RS232C is DB9.
Where,
2 –> RXD，3 –> TXD，5 –> GND

Note
The instrument's RS485 port uses 7 and 8 two pin in DB9 port, if user has ordered two RS232C and RS485 function at the same time, not use 9 core connecting lines to link up with instrument and PC machine, two of RS485 pin communication that can disturb RS232C, makes communication fail. Use 3 core communication lines and PC machine to link up

12.2 Communication Using RS485（Option）

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [system] screen.



Item	Content
Communication address	0 – 255
Communication baud rate	1200/2400/4800/9600/19200/38400/57600
Communication parity mode	None/Odd/Even

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

Explanation

1. Connects communication wiring.
2. Sets the instrument's communication address, baud rate, parity mode.
3. The setting of the PC's communication address, baud rate, and parity mode are the same of the instruments.
4. Use it.

The port of RS485 is DB9.
Where,
7 –> 485+，8 –> 485-

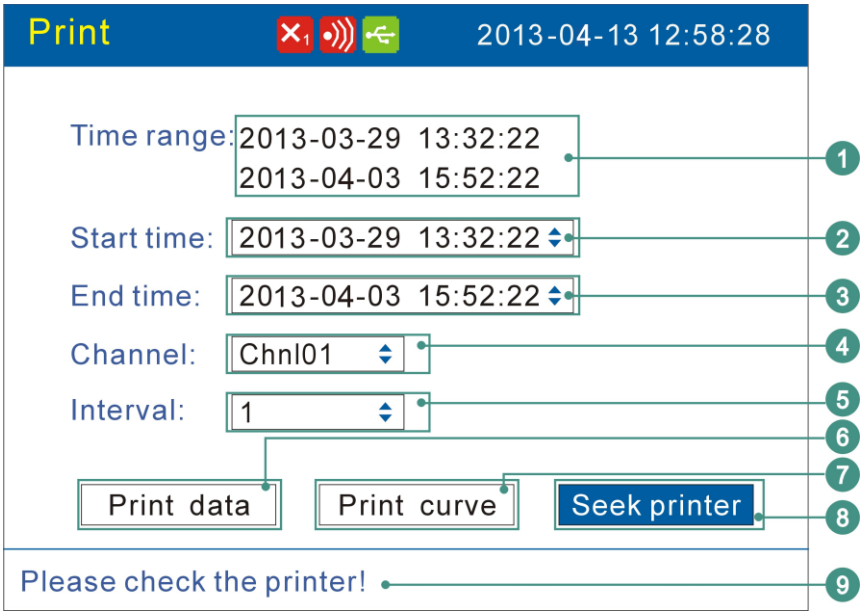
Note

- Allow multiple instruments to connect to RS485 network. Use the type of the bus-based connections.
- When the link of the RS485 is further or the interference in the connecting with the bus is larger. Add 120Ω resistance at both ends in the network. Connection is between the 485+ and 485-.

12.3 Connect with Micro Printer（Option）

The instrument can connect with the micro printer.

Procedure



1. The printer’s time range
2. Set the printer’s start time
3. Set the printer’s end time
4. Select the print channel
5. Set the interval
6. Print the data
7. Print the trend
8. Seek the connection printer
9. The printer state.

Explanation

Use the RS232C port to connect the instrument and the printer

Port	Printer port
RXD	RTS
TXD	RXD
GND	GND

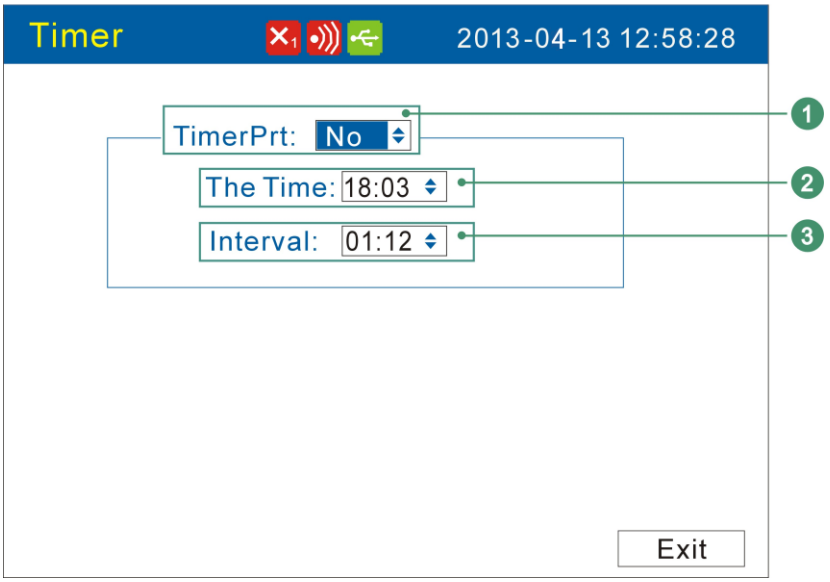
Set the printer’s communication parameter (the instrument doesn’t need)

Baud rate	9600
Start bit	1
Data bit	8
Parity	None

12.4 Auto Print Function Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Timer] screen.



1. Set the timer print function
   Move the cursor to [Timer Prt], choose it with [Up] and [Down]
   [Yes]： The timer print function is opened.
   [No]： The timer print function is closed.
2. The starting time
3. Interval: Between two printing time intervals.

Confirming operation

After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [Timer] screen.
Select [No] to cancel setting content, and exit [Timer] screen.
Select [Cancel] to continue setting parameters in [Timer] screen.

Note

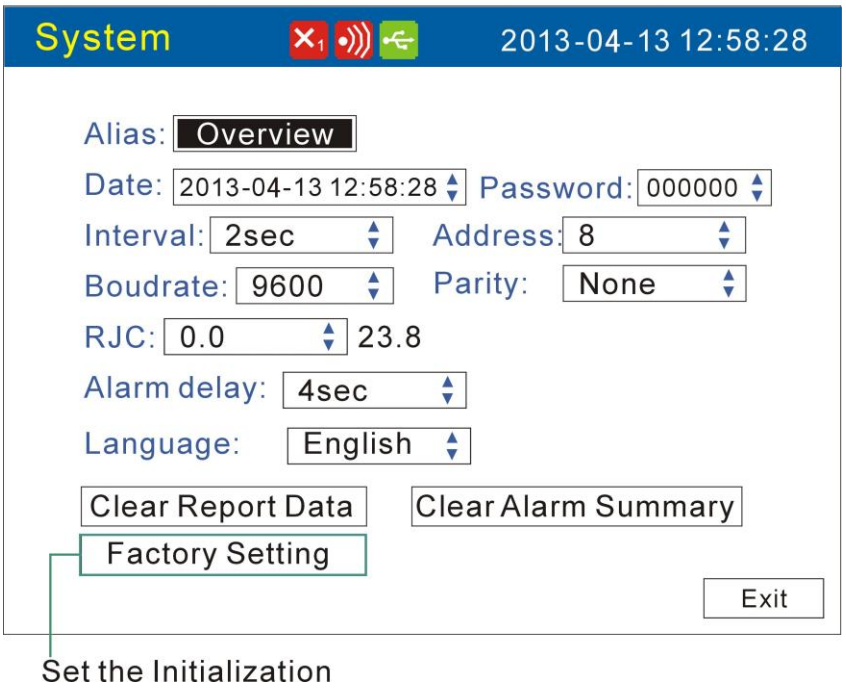
- When use the timer print function, the printer must connect with the instrumental the time.
- About the printer setting, see section 10.3.

Chapter 13 Initializing Data

13.1 Restore Factory Setting

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [system] screen.



Restore factory setting
Move the cursor to [Factory Setting], press [En].

Confirming operation

Select [Yes] and press [En] to restore factory setting.
Select [No] and press [En] to cancel factory setting.

After Restore Factory setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

Note
After factory setting, the historical data stored in instrument will be cleared. Before the factory setting, please backup the historical data.

Explanation

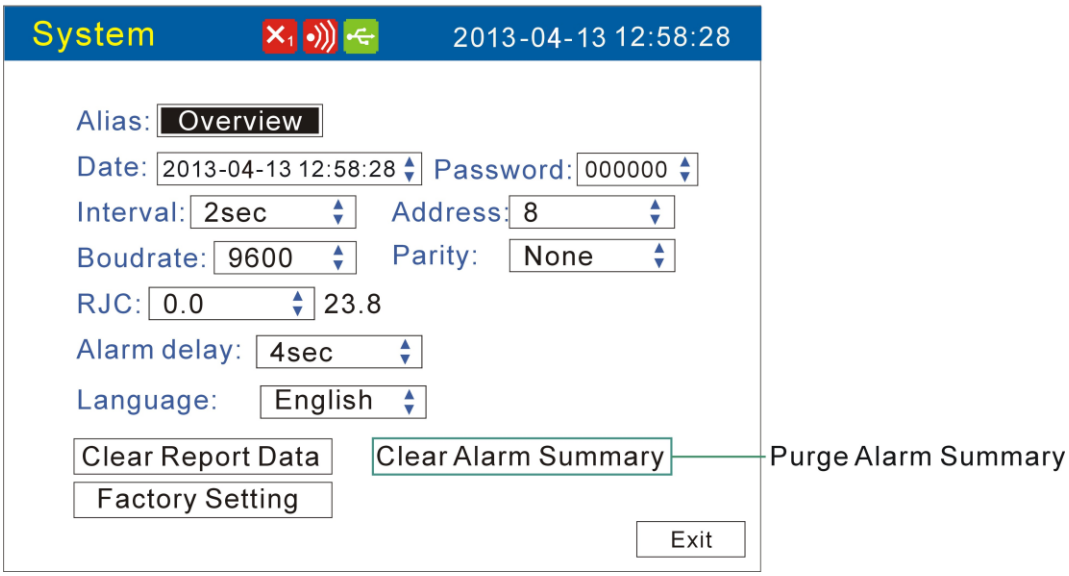
The influencing parameter tabulation

Type	Name	Value
System parameter	Alias	Overview
	Password	000000
Display parameter	Direction	Horizontal
	Group1	Enable Group1 – Chnl1 –purple Group2 –Chnl2 – green Group3 –Chnl3 – blue Group4 –Chnl4 – yellow
	Group2 – 4	Prohibited
Data save parameter	Interval	02 S
Communication parameter	Address	8
	Baud rate	9600
	Parity	None
	Timing printer	Prohibited
Analog input parameter （all channels）	Tag	Channel[No.]
	Type	4-20mA
	Unit	%
	lower limit	4.00
	Upper limit	20.00
	Accumulation	No
	Accumulation rate	1
	Vacuum	No
	Filter	0.0 sec.
	Burnout	Minimum
	Cold junction adjustment	0.0
	Square	No
	Cut	0.0%
	Adjust value K	1.00
	Adjust value B	0.00
Alarm parameter （all channels）	Alarm low low threshold	4.00
	Alarm low threshold	4.00
	Alarm high threshold	20.00
	Alarm high high threshold	20.00
	Alarm contact(all alarm)）	0
	Zone	0.00
Analog output parameter （all loops）	Analog output	No
	Adjust value K	1.00
	Adjust value B	0.00

13.2 Purge Alarm Summary

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [system] screen.



Purge Alarm Summary

Move the cursor to [Purge Alarm], press [En].

Confirming operation

Select [Yes] and press [En] to purge alarm summary.
Select [NO] and press [En] to cancel purge alarm summary.

After Purge Alarm Summary, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exits [System] screen.
Select [No] to cancel setting content, and exits [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

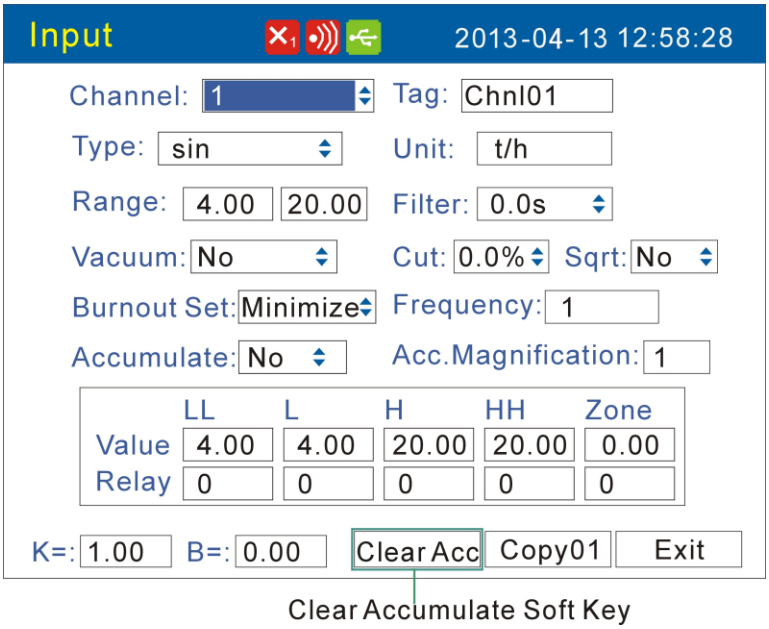
Explanation

Clearing alarm list will eliminate alarm records in memory, and can not be recovered.
Clearing alarm list will not affect other parameters and functions of this instrument.

13.3 Purge Accumulation Data

Procedure

Press [Page] and [En] at the same time, enter the configuration menu.
Use arrow keys and [En] to input the password, enter the [Input] screen.



Clear Accumulate

Move the cursor to [Clear Acc], press [En] key.

Confirming operation

Select [Yes] and press [En] to purge accumulation data.
Select [NO] and press [En] to cancel purge accumulation data.

After Purge Alarm Summary, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exits [Input] screen.
Select [No] to cancel setting content, and exits [Input] screen.
Select [Cancel] to continue setting parameters in [Input] screen.

Explanation

Clearing accumulation will eliminate accumulation records in memory, and can not be recovered.
Clearing accumulation will not affect other parameters and functions of this instrument.

Chapter 14 Specifications

14.1 Signal and Alarm Specifications

Measures input

<table>
<tr><td>Item</td><td>Specification</td></tr>
<tr><td>Number of input channels</td><td>Measuring 12 channels at the same time(maximum)</td></tr>
<tr><td>Scan Interval</td><td>1 second</td></tr>
<tr><td>Signal types</td><td>DC current(I)、Volt(V)、thermocouple(TC)、resistance temperature detector(RTD)、frequency(FR)</td></tr>
<tr><td>Measure range</td><td>
<table>
<tr><td>Input type</td><td>Range</td><td>Measuring range</td></tr>
<tr><td>Current</td><td>4-20mA</td><td>4.00mA ～ 20.00mA</td></tr>
<tr><td></td><td>0-10mA</td><td>0.00mA ～ 10.00mA</td></tr>
<tr><td>Volt</td><td>1-5V</td><td>1.000V ～ 5.000V</td></tr>
<tr><td></td><td>0-5V</td><td>0.000V ～ 5.000V</td></tr>
<tr><td></td><td>0-10V</td><td>0.000V ～ 10.000V</td></tr>
<tr><td></td><td>20mV</td><td>0.00mV ～ 20.00mV</td></tr>
<tr><td></td><td>100mV</td><td>0.00mV ～ 100.00mV</td></tr>
<tr><td>Resistance</td><td>350Ω</td><td>0.0Ω ～ 350.0Ω</td></tr>
<tr><td>Frequency</td><td>FR</td><td>0Hz ～ 10000Hz</td></tr>
<tr><td>RTD</td><td>PT100</td><td>-200.0℃ ～ 650.0℃</td></tr>
<tr><td></td><td>Cu50</td><td>-50.0℃ ～ 140.0℃</td></tr>
<tr><td></td><td>Cu53</td><td>-50.0℃ ～ 150.0℃</td></tr>
<tr><td></td><td>BA1</td><td>-100℃ ～ 600℃</td></tr>
<tr><td></td><td>BA2</td><td>-100℃ ～ 600℃</td></tr>
<tr><td>TC</td><td>S</td><td>-100℃ ～ 1600℃</td></tr>
<tr><td></td><td>R</td><td>-50℃ ～ 1600℃</td></tr>
<tr><td></td><td>B</td><td>500℃ ～ 1800℃</td></tr>
<tr><td></td><td>K</td><td>-50℃ ～ 1300℃</td></tr>
<tr><td></td><td>N</td><td>-200℃ ～ 1300℃</td></tr>
<tr><td></td><td>E</td><td>-100℃ ～ 1000℃</td></tr>
<tr><td></td><td>J</td><td>-100℃ ～ 1000℃</td></tr>
<tr><td></td><td>T</td><td>-100℃ ～ 380℃</td></tr>
<tr><td></td><td>WRE5-26</td><td>0℃ ～ 2310℃</td></tr>
<tr><td></td><td>WRE3-25</td><td>0℃ ～ 2315℃</td></tr>
<tr><td></td><td>F1</td><td>600℃ ～ 2000℃</td></tr>
<tr><td></td><td>F2</td><td>600℃ ～ 2000℃</td></tr>
</table>
Measuring current: I = 0.5mA(Resistance、RTD)
</td></tr>
<tr><td>Thermocouple burnout</td><td>Select the displays of MAX,MIN, Error sign and Keep the anterior values
Standard：≤2kΩ， burnout：≥100kΩ
Measuring current： about 2.5uA</td></tr>
</table>

Item	Specification
The thermocouple reference junction compensation	Use the interior reference junction compensation, compensation precision ±0.5℃
Digital filtering	0～9.9 seconds inertia filter
Vacuum operation Common arithmetic Subsection arithmetic	 Use the LOG trend operation in the whole range Use the linearity operation at each subsection

Alarm

Parameter	Specification
Number of alarms	Up to four alarms for each channel
Alarm types	Ultra Upper limit alarm Upper limit alarm Lower limit alarm Ultra Lower limit alarm
Alarm delay time	Selectable from 1s to 3600s for each channel
Alarm output	Output to the interior relay Number of the interior relay：12 The interior relay operation：OR operation
Display	When has alarming, in corresponding screen display alarm condition, in Status Display Section display alarm icon
Alarm information	Display the alarm log that occurred in the alarm summary

14.2 Display Specifications

Display

Item	Specification
Display*	5.6”TFT color LCD (234-by-320 dot resolution)

* LCD display may have some pixels light or dark, because of the difference function of LCD, and the LCD brightness possibly is also dissimilar, but these are not malfunction.

Display information

Item	specification
Display group	Assigns the channel for the group of trend and history.
Group	4
Assign to each group's channel number	≤ 4
Display color	RGB
Trend display	
Update rate	One note interval
Waveform line width	1 pixels
Display method	Display the right angel with time shaft(T) and measurement value(Y) Distribution： Horizontal、Vertical Trend period： saving interval ×30 div
Scale	Display each channel scale(0%～100%)
Figure display	The measured value is displayed by number
Update rate	1 second
Bar display	The measured value is displayed in bar chart
Update rate	1 second
Scale	0% ～ 100%
History display	Display the saving data of EMS memory
Time shaft	Zoom in 1times/2 times /4 times /8 times /16 times /32 times
Display alarm summary	Most display 15 pieces alarm

Other display information

Item	Specification
Channel tag	10 characters (Numbers)
Channel units	7 characters (Numbers)
Status display Display content	Display the instrument’s status in top part of display screen. Name, board card status, alarm status, USB status, circulation status, history status, year, mouth, day, hour, minute and second.
Auto-switch	Switch the display group in the appointed time interval Interval： 10 second
Language	English
System information display	Display the in-out、relay output modes、instrument additional function、Firmware-Version and release date

14.3 Data Storage Specifications

Configure

Item	Specification
Onboard memory	Interior data storage
Medium	FLASH
Content	6MB
Operation	FIFO(first-in first-out)
Exterior storage medium	Backup interior memorized data
Medium	U disk
Content	Maximum 2GB
File format	FAT32
File name	DAT + “number”

Data type

Item	Specification
Data size	
Sampling	2 bytes/Data
Accumulation	4 bytes/Data
Data format	Binary system data
Sampling periods	Up to register interval
Note mode	Register all the time

14.4 Other standard functions

The correlative function of the time

Item	Specification
Clock	Run between 2000~2099
Clock precision	±10ppm(0 to 50℃), excluding a delay (of 1 second, maximum) caused each time the power is turned on.
Batteries Longevity	About 10years(room temperature)

The input character types

Item	Specification
Character	English(lowercase)、English(capital)、Numeral and symbol (limited)

14.5 Select fittings

Alarm output relay

Item	Specification
Motion	When alarm acts, output relay signal on the back panel's terminals.
Output ports	Maximum 12
Relay connect rating	250VAC(50/60Hz)/3A，250VDC/0.1A(load resistance)
Output format	Normally open or close
Relay operation	OR operation

RS232C/RS485

Item	Specification
Confer	MODBUS-RTU
Baud rate	1200/2400/4800/9600/19200/38400/57600 bps
Date length	8Bytes
Parity mode	None/odd/even

24VDC wiring

Item	Specification
Loop	4
Output voltage	22VDC ～ 25VDC（rating output current）
Maximum output current	65mADC（Over current protection operation current: approximately 90mADC）
Allow impedance	≤ 750Ω

USB function

Parameter	Specification
USB port	Compatible USB2.0 composition
Ports	1
Power supply	5V ±10%，100mA
Attachable equipment	U Disk

Analog signals output

Parameter	Specification
Output type	4-20mA
Output channels	Most 4
Allowed impedance	≤ 750Ω

14.6 General Specifications

Construction

Parameter	Specification
Mounting	Flush panel mounting(on a vertical plane)
Mounting Pitch	Mounting may be inclined backward up to 30 degrees from a horizontal plane.
Allowable Panel Thickness	2 to 26mm
Material	Front Panel & Rear Panel： ABS Case: Aluminum alloy
Dimensions	144(W)×144(H)×220(D) mm
Weight	Approx 4.0Kg(without Optional Accessories)

Standard operating conditions

Parameter	Specification
Power supply voltage	220VAC
Power supply frequency	50Hz
Ambient temperature	0℃ ～ 50℃
Ambient humidity	0% ～ 85%
Warm-up time	At least 30 minutes after power on
Installs position	Indoor

Power

Parameter	Specification
Rated power supply	220VAC
Allowable power supply voltage range	85VAC ～ 265VAC
Rated power supply frequency	50Hz ～60Hz
Rated power consumption	≤59W(include option functions)

Insulation

Parameter	Specification
Dielectric strength	Between measuring input terminals：≥400V
Earth resistance	Earth resistance ≤ 10Ω

Transport and Storage conditions

Parameter	Specification
Ambient temperature	-10℃ ～ 60℃
Ambient humidity	0% ～ 95%

Standard Performance

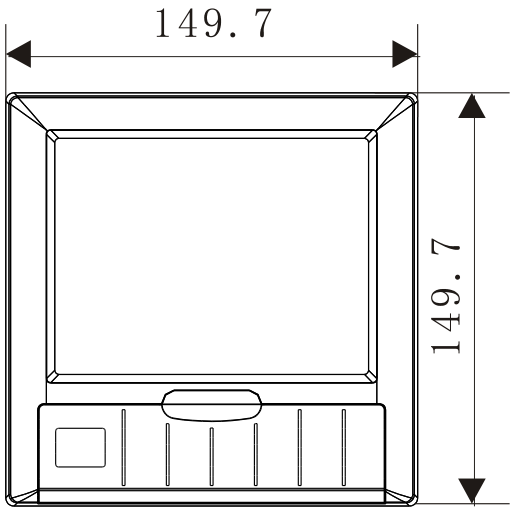
Parameter	Specification
Measuring Accuracy	Standard operating conditions temperature： 23±2℃ humidity： 55%±10%RH power supply voltage： 220VAC power supply frequency： 50Hz±1% warm-up temperature： at least 30 minutes after power on Other ambient conditions such as vibration should not adversely affect the operation. Measuring accuracy: Entire measuring range error≤ 0.2%F.S. Trend accuracy：0.5%F.S.
Maximum allowable input voltage	-2VDC ～ +10VDC
Input resistance	Voltage signal： ≥1MΩ Current signal： 250Ω
Resistance measure excitation current	0.5mA
Burnout measure current	About 2.5uA
Maximum common mode noise voltage	≥ 300VACrms(50Hz)
Normal mode rejection	5VDC： 1VAC(50Hz) 100mV： 100mVAC(50Hz) 20mV： 50mVAC(50Hz)

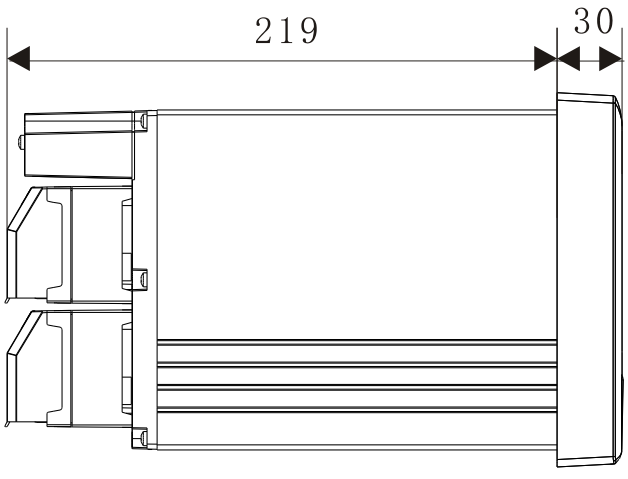
Other standards

Parameter	Specification
Data storage age limit	About 10 years

14.7 Dimensional Drawings

Unit: mm

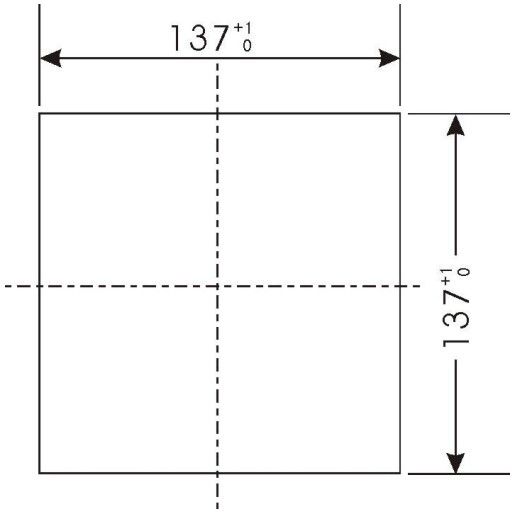




Panel Cutout

Unit: mm

Single-Unit Mounting



Print in China